Vol. XL MARCH, 1920 No. 7

EDUCATION

A MONTHLY MAGAZINE

DEVOTED TO THE SCIENCE, ART, PHILOSOPHY AND LITERATURE OF EDUCATION

FRANK HERBERT PALMER, A. M., EDITOR

THIS NUMBER OF EDUCATION IS THE OFFICIAL ORGAN OF THE NEW ENGLAND ASSOCIATION OF COLLEGES AND SECONDARY SCHOOLS AND REPRODUCES THE ADDRESSES OF THE AUTUMN MEETING. THE SPRING MEETING WILL BE HELD AT YALE UNIVERSITY, APRIL 24, 1920.

CONTENTS

The New England Association of Colleges and Secondary Schools. Announcement of the Meeting and Program. 395

The Purposes and Methods of Psychological Tests in Schools and Colleges. *Stephen Sheldon Colvin.* 404

The Educational Significance of the Army Intelligence Tests. *Raymond Dodge.* 417

The Place of Psychological Tests in the Admission of Students to College. *Adam Leroy Jones.* 429

The Attitude of the Massachusetts Legislature Towards Standards for Degree Giving Institutions. *Senator George B. Churchill.* . . . 432

Community Organization for Vocational Guidance. 447

American Notes—Editorial. 453

Book Reviews. 456

Periodical Notes. 462

BOSTON

Published by THE PALMER COMPANY, 120 Boylston Street

LONDON, E. C.: WM. DAWSON & SONS, LTD., CANNON HOUSE, BREAMS BUILDINGS

Entered at the Post Office at Boston, Mass., as second-class mail matter.

Price 35 Cents $3.00 a Year

"The problems of health in the individual cannot be met by mere checks on disease alone, or by information on the dangers imminent; indeed, national health presents the same situation. There must come virile motives for attaining a fine end, motives that are rationalized and conscious."

(Jesse Feiring Williams of Teachers College, Columbia University, in the *Educational Review* for January, 1920.)

HEALTH *instruction*, in other words, is not in itself sufficient: *inspiration* is also required if health teaching is to be effective. "A rational life aflame with moral purpose" (as Dr. Williams says at the conclusion of the same article) is the only adequate remedy for a narrowness of vision and lack of worthy motives in matters of health which are a menace to the welfare of the individual and the race.

O'SHEA and KELLOGG are the only authors of a series of elementary school texts in this subject that have devoted an entire volume to the type of motivation or inspiration for which Dr. Williams so eloquently pleads.

Making the Most of Life (the concluding volume of this series, entitled **The Health Series of Physiology and Hygiene**) is entirely devoted to what Dr. Williams, in this article, calls "the fundamental purpose of health and the possibilities of a magnificent life."

No other elementary textbook in physiology and hygiene remotely approximates the ideal set forth in this article.

If these ideas interest you, why don't you examine a high school textbook by the author of the article which we have quoted? Williams' HEALTHFUL LIVING, published last summer, accomplishes for high school students what the O'Shea and Kellogg books do for pupils in the grades.

THE MACMILLAN COMPANY

New York Boston Chicago
Dallas Atlanta San Francisco

EDUCATION

Devoted to the Science, Art, Philosophy and Literature of Education

VOL. XL. MARCH, 1920 NO. 7

The New England Association of Colleges and Secondary Schools

ANNOUNCEMENT OF THE MEETING.

The thirty-fourth annual meeting of the Association will be held in Jacob Sleeper Hall, Boston University, on Friday and Saturday, December 5th and 6th, 1919. Jacob Sleeper Hall is on Boylston Street, next to the Boston Public Library.

On Friday evening, at half after six, a dinner will be served at the Hotel Vendome. The Hotel Vendome is on Commonwealth Avenue, two blocks from Boston University.

The guests of honor will be President Eliot, President Emeritus of Harvard University; President Faunce of Brown University; and State Senator George B. Churchill, Chairman of the Committee on Education of the Massachusetts Legislature. This is the fiftieth anniversary of the election of President Eliot to the presidency of Harvard University, and the twentieth anniversary of the election of President Faunce to the presidency of Brown University. It is important that the secretary should receive notice of your intention to be present at the dinner as early as possible, on or before December 3rd. Tickets for members will be two dollars; for those not members, two dollars and a half. Ladies may be invited.

Proposals for new members should be given to the secretary before the close of the first session.

HORACE DUTTON TAFT, President.

WALTER BALLOU JACOBS, Secretary.

Brown University, Providence, R. I., Nov. 24, 1919.

PROGRAM.

FRIDAY AFTERNOON, DECEMBER 5.

Jacob Sleeper Hall.

3.00—The Place of Psychological Tests in School and College.

1. The Purposes and Methods of Psychological Tests in School and College.
   STEPHEN SHELDON COLVIN.
   Professor of Educational Psychology, Brown University.
2. Results of the Army Psychological Tests and Their Meaning for Education.
   RAYMOND DODGE.
   Professor of Psychology, Wesleyan University.
3. The Place of Psychological Tests in the Admission of Students to College.
   ADAM LEROY JONES.
   Director of University Admissions, Columbia University.
4. Discussion.

FRIDAY EVENING, DECEMBER 5.

An Anniversary Dinner.

6.30—Dinner and Reception at the Hotel Vendome.

The guests of honor will be President Eliot, President Emeritus of Harvard University; President Faunce of Brown University, and State Senator George B. Churchill, Chairman of the Committee on Education of the Massachusetts Legislature.

Dress informal. Social half-hour, 6.00 to 6.30.

This year marks the fiftieth anniversary of the election of President Eliot as President of Harvard University; President Faunce of Brown University and President Hadley of Yale University were both elected president twenty years ago. President Hadley will be unable to be present at the dinner, but will send greetings.

SATURDAY MORNING, DECEMBER 6.

Jacob Sleeper Hall, Boston University.

9.00—Business Meeting.

1. Report of Executive Committee and Election of New Members.
2. Reports of the Secretary and Treasurer.
3. Report of the Nominating Committee and Election of Officers.
4. Reports of the Delegates to the College Entrance Examination Board.

9.30—Report of the Committee on Standards for Secondary Schools.

FRANK W. NICOLSON, Wesleyan University, Chairman.

Discussion.

10.00—Report of the Committee on Standards for Colleges.

PRESIDENT ALEXANDER MEIKLEJOHN, Amherst College, Chairman.

Discussion.

Attitude of the Massachusetts Legislature towards Standards for Degree-giving Institutions.

SENATOR GEOORGE B. CHURCHILL, of the Massachusetts Legislature.

Further Discussion.

OFFICERS, 1918-1919.

President,
HORACE DUTTON TAFT.

Vice-Presidents,
CALEB THOMAS WINCHESTER. JAMES ARTHUR TUFTS.

Secretary-Treasurer,
WALTER BALLOU JACOBS.

Executive Committee,
(With the preceding)
LEMUEL HERBERT MURLIN, CLEMENT COLLESTER HYDE,
ERNEST GRANGER HAPGOOD, WILLIAM COLVER HILL,
BERTHA MAY BOODY.

Delegates to the College Entrance Examination Board.

Lewis Percy, term expires 1919; William Gallagher, term expires 1920; N. Henry Black, term expires 1921; James David Howlett, term expires 1922.

Committe on Standards for Secondary Schools.

Frank W. Nicholson, Wesleyan University, chairman; Robert N. Corwin, Yale University; Otis E. Randall, Brown University; Lewis Perry, Phillips Exeter Academy; Howard Conant, Holyoke High School.

Committee on Standards for Colleges.

Alexander Meiklejohn, Amherst College, chairman; Kenneth C. M. Sills, Bowdoin College; Frederick S. Jones, Yale University.

RECORD OF THE BUSINESS SESSION.

December 6, 1919.

The business session of the thirty-fourth annual meeting of the New England Association of Colleges and Secondary Schools was held December 6, 1919, in Jacob Sleeper Hall, Boston University, at nine o'clock, President Taft presiding.

On recommendation of the Executive Committee it was voted that the following be elected to membership in the Association:

Winfred Chandler Akers, Head Master High School, Brookline, Mass.

Alice Frances Blood, Professor of Dietetics, Simmons College, Boston, Mass.

Chapin Brinsmade, Instructor in English and French, Gunnery School, Washington, Conn.

Sara A. Clapp, Head of Modern Language Department, High School, Medford, Mass.

Marion Coates, Principal, Bradford Academy, Bradford, Mass.

Howard Conant, Principal High School, Holyoke, Mass.

Jessie Degen, Principal The May School, Boston, Mass.

Carl Stephen Ell, Dean Engineering Schools, Northeastern College, Boston, Mass.

William Lusk Webster Field, Head Master Milton Acedemy, Milton, Mass.

Mary E. Haskell, Principal Cambridge School, Cambridge, Mass.

John Wood Hatch, Principal Montpelier Seminary, Montpelier, Vt.

Emily Frances Hunt, Head Science Department, Cambridge School for Girls, Cambridge, Mass.

Horace Edgar Jacobs, Teacher High and Latin School, Cambridge, Mass.

John Louis Keegan, Instructor in English, Tufts College, Mass.

George H. D. L'Amoureux, Professor of French and Citizenship, American International College, Springfield, Mass.

Frances Lee, Principal Miss Lee's School, Boston, Mass.

KATHERINE LORD, Assistant Director, Winsor School, Boston, Mass.

KATHERINE G. MCLEAN, Teacher, Hartford Public High School, Hartford, Conn.

LOUIS JOSEPH ALEXANDER MERCIER, Professor of French, Harvard University, Cambridge, Mass.

ADELAIDE NICHOLS, English Teacher, Milton Academy Girls, Milton, Mass.

HARRIET RUSSELL PIERCE, Instructor Mathematics, Classical High School, Worcester, Mass.

WILLIS BRAINARD ROBINSON, Head Mathematical Department, American International College, Springfield, Mass.

GARRET STRYKER, Administrative Secretary, Teacher of English and Bible, American International College, Springfield, Mass.

KATHERINE M. THOMPSON, Principal Buckingham School, Cambridge, Mass.

CHARLES FRANKLIN TOWNE, Associate Principal, Lasell Seminary, Auburndale, Mass.

MARGARET COLEMAN WAITES, Associate Professor of Latin, Mt. Holyoke College, South Hadley, Mass.

THOMAS WEBB WATKINS, Associate Head Master, Huntington School, Boston, Mass.

On recommendation of the Executive Committee, Lewis Perry was elected a delegate to the College Entrance Examination Board for the usual term of four years.

A motion that the secretaries—or secretaries and presidents—of the various New England Associations whose interests center about the college and secondary school, be made *ex officio* members of this Association, with the understanding that the other associations reciprocate, was referred to the Executive Committee with power.

The following formulation of the general policy of the Executive Committee in its conduct of the affairs of the Association was read and approved by vote of the Association:

1. The membership of the Association should be largely increased. The educational leaders in New England who are inter-

ested in the problems which concern the college and the secondary school should be brought into active membership in the Association. Immediate steps should be taken to increase the membership of the Association to at least five hundred.

2. The Annual Meeting of the Association should be held in Boston, but there should also be a "Spring Meeting" held each year in a part of New England more or less distant from Boston; for example, one year in New Haven, another year in Springfield, another year in Portland.

3. Co-operation with the other associations in New England whose interests center about the college and secondary school has already been initiated. The co-operation should be greatly strengthened and enlarged. The date of the Annual Meeting of our Association should be a convention date in which all these associations should have a part. Teachers should be granted the privilege of leaving their schools to attend these convention meetings. Colleges, private schools, and public schools should not only urge their instructors to attend, but be ready to contribute to the expenses incurred. In the solving of educational problems our Association, representing all educational fields and all educational interests, should be a clearing-house where the pronouncements of the various departmental associations should be discussed and harmonized.

4. The Annual Saturday morning business session should be devoted to reports of active committees offering solutions for current educational problems, and to the discussion of these reports. Not more than one formal address should be placed upon the Saturday morning program. The proceedings of this session should be published.

5. The Executive Committee as a body should have a very much more important place in the conduct of the Association than it has had in the past. It should meet more frequently. It should discuss in a preliminary way the educational problems which arise in New England. It should itself present to the Association tentative solutions of these problems or entrust the study of such problems to small active committees.

As the record of the business of the last annual meeting of the Association had been printed and sent to the members, the reading of the record was omitted. The secretary presented the following analysis of the membership of the Association as of April, 1919:

ANALYSIS OF MEMBERSHIP, APRIL, 1919.

	Men	Women	Total
Colleges	90	42	132
Private Schools	80	28	108
Public Schools	68	14	82
Superintendents, etc.	13	..	13
Totals	251	84	335

The report of the treasurer from January 31, 1918, to January 31, 1919, was approved and placed on file.

The Nominating Committee, consisting of Robert N. Corwin, William Gallagher, Arthur O. Norton, Frederick Winsor and Enoch C. Adams, presented the following list of officers for the ensuing year, and they were elected:

President, LEMUEL HERBERT MURLIN.

Vice-Presidents, JAMES ARTHUR TUFTS, GEORGE DANIEL OLDS.

Secretary-Treasurer, WALTER BALLOU JACOBS.

Executive Committee (with the preceding), ERNEST GRANGER HAPGOOD, CLEMENT COLLESTER HYDE, WILLIAM COLVER HILL, BERTHA MAY BOODY, CLIFFORD HERSHEL MOORE.

The secretary was directed by vote of the Association to express to Caleb Thomas Winchester, First Vice-President of the Association, the deep regret of the Association that the condition of his health made it unwise, in his opinion, to hold the office of President for the ensuing year.

The report of the delegates to the College Entrance Examination Board was presented by William Gallagher.

The report of the delegates to the National Conference on College Entrance Requirements in English was presented by George H. Browne. The report was adopted by the Association.

Upon motion of Clement C. Hyde it was voted that the thanks

of the Association be extended to Boston University for the use of Jacob Sleeper Hall.

The report of the Committee on Standards for Secondary Schools was presented by the chairman, Frank W. Nicolson.

It was voted: That the Executive Committee be instructed to appoint a committee representing all elements of the Association and including representatives of the State Boards of Education, the function of the committee to be the improvement of the standard of the Secondary Schools in New England.

This committee is to report at the next annual meeting of the Association.

The Executive Committee appointed the following Committee on Standards: William C. Hill, chairman; Frank W. Ballou, Robert N. Corwin, Mabel H. Cummings, Clarence D. Kingsley, Anna J. McKeag, Guy M. Winslow.

The report of the Committee on Standards for Colleges was presented by the chairman, Alexander Meiklejohn.

In accordance with the recommendations of the committee, it was voted:

1. That the question of standards for colleges be made an order of business for the next annual meeting.

2. That the President of the Association be directed to appoint a committee to collect and formulate information bearing upon the question and to place such information in the hands of members of the Association in advance of the meeting.

3. That the committee be also requested to report at the next meeting upon two phases of the question: (a) the educational principles involved in the procedure; (b) its probable effect in specific cases upon institutions within the territory of the Association.

4. That the membership of the committee be as follows: The president of the Association, three representatives of schools, three representatives of colleges.

Adjourned.

WALTER BALLOU JACOBS, *Secretary.*

The Purposes and Methods of Psychological Tests in Schools and Colleges

STEPHEN SHELDON COLVIN, PROFESSOR OF EDUCATIONAL PSYCHOLOGY, BROWN UNIVERSITY.

ALL forms of human behavior may be ultimately traced to two fundamental causes, namely inheritance and environment. Each individual is born with definitely inherited mechanisms and abilities for responding to his environment and his subsequent experience acts on his original nature to inhibit, modify or develop his inheritance in various directions. Without inborn abilities and tendencies on which experience may build, there could be no learning, and without learning there could be no behavior save that of the simplest and most rudimentary type. Learning is absolutely necessary for human attainment, but learning is always conditioned on the inherited nature of the individual. It is not worth our while here to discuss which is the more important, nature or nurture. It is sufficient to say that if either of these two mainsprings of human conduct is markedly deficient in any individual that person can reach no high level of achievement.

Our inheritance provides us with numerous reflexes, instincts and capacities, some of which are very specific and some quite general in their manifestation. A few of these are capable of but slight modification through environmental influences, while others, the more complex and less specific, are dependent on experience for their development and expression. Those inborn tendencies which we call capacities (and to a less degree instincts) belong to this latter class. One may have a capacity for music, or mathematics, but no one without much specific training ever became a great musician or a famous mathematician.

Among the capacities that we inherit is the ability to act with a certain degree of intelligence in various situations of life, pro-

vided that we have had previously a certain acquaintance with these or similar situations. This ability has been termed by the psychologist, "general intelligence." It must be kept in mind that this is not general in the sense that the individual possessing it is capable of responding to all varieties of situations in an equally intelligent way, even if he has had adequate experience in all of these situations. No one is born with a capacity so general that it may manifest itself equally well in all phases of human endeavor or achievement. In some things he is by nature more capable than in others. It is possible that he may be a brilliant user of words and a clumsy user of his hands, even if he has had ample opportunity to acquire skill in both. In one situation he would be by nature bright, and in another stupid.

By general intelligence the psychologist means an inborn ability which, when joined with adequate training, enables an individual to act with a similar degree of effectiveness in a large variety of situations, though surely not in all that might arise. Through the possession of a high degree of general intelligence one individual finds it possible to achieve success in many human undertakings, while because of the lack of such intelligence another is doomed to mediocrity or failure in practically all callings that he may enter upon. It may thus be seen that general intelligence is not absolutely but only relatively general in its nature, and it must further be kept in mind that it can never manifest itself apart from the training that comes through life experience.

It is a matter of common knowledge that children and older pupils show a wide range of achievement in their school work. The cause of this variability in performance is now considered to be due chiefly to differences in original endowment (in general intelligence). One reason for this conclusion is that since all have had practically the same opportunities for acquiring knowledge and skill during the course of their school training, those who succeed the best do so because it was "born in them" to succeed, and those who do mediocre and poor work do so because they were given only a modicum of the capacity to become intelligent. This being the case, it is highly important for the teacher

to know with reasonable certainty what is the inborn ability of the boy or girl who is entrusted to his guidance and tuition.

The question now arises: How is it possible to measure general intelligence? Here we are confronted with a difficulty which at first seems so great that its solution seems impossible. We have already said that general intelligence, which is innate and never learned, cannot manifest itself in independence of learning. From this it follows that any test for general intelligence that we may devise will be a test based on learning. However, it is not learning which we wish to test at all, but only the inborn ability which lies at the basis of all human attainment. Fortunately, there is a way out of the apparently insurmountable difficulty, and that is by devising tests which shall measure the attainments of the individuals in those things where all have had approximately the same opportunities to acquire skill and knowledge. If this is done, it will be found that within a group of individuals tested large variations in ability will be found. Now, since we assume that all of the members of this group have had the same opportunities, it follows that the variations in attainment are not primarily due to learning but to an inherited capacity to learn, in other words, to general intelligence.

It can be seen, from the above statement, that in framing tests to measure general intelligence we must be extremely careful to base the materials included in these tests on matters that are of common experience in the group tested, or perhaps we had better say, on matters for which there is an opportunity for common experience, since those of high intelligence will seize upon all opportunities to acquire worth-while experience while those of low intelligence will pass such opportunities by. It can further be seen that there can be no general test for general intelligence, that is, a test which will accurately measure the native endowment of all individuals chosen at random, since the materials for the test must be selected on the basis of common experience, and common experience cannot be indefinitely generalized. As the individual develops from infancy to maturity, experiences become more and more special and dependent upon group activities rather

than upon activities shared by all members of the human race. These latter would be very few and would be totally inadequate as the basis for a general intelligence test.

The first definite attempt to measure general intelligence dates back to the year 1905. At this time, the French psychologist Binet and the French physician Simon constructed a rough scale of thirty tests standardized by results obtained from normal children of the ages three, seven, nine and eleven years. The first quantitative scale by these authors appeared in 1908. In this there were fifty-six tests arranged according to ages from three to thirteen. For each age there were from four to eight tests. In 1911, a revised scale was published, in which some of the tests were discarded. In this revision there were five tests for every year, except one, from the ages three to ten. Tests were also added for the twelfth and fifteenth years and for the adult. The purpose of these tests was primarily to discover children of low mentality and separate them from those of normal ability.

I shall not at this time attempt in any detailed way to describe the nature of the Binet tests. Doubtless many of you here are perfectly familiar with them, and those who have slight knowledge of the scale can find it presented in its best form by Terman, who has most thoroughly revised it, in his book, "The Measurement of Intelligence." The tests used, to apply Terman's description, are of the nature of "stunts" or "problems." They are based on the principle that all intelligent individuals have had an opportunity to acquaint themselves with the facts relating to these "stunts" and to acquire the ability necessary to solve these "problems," and if a child fail in the test suitable to his age it is because of a lack of original ability rather than because of a defect in learning. As has been said, the tests are arranged according to years, the test materials increasing in difficulty from year to year; in the Terman revision there are five for each year from three through ten, and also five for the ages of twelve, fifteen, and for the adult. The tests consist of such simple matters as the recognition of familiar objects, the repeating of digits, the enumeration of ob-

jects in pictures, counting, copying geometrical figures, executing commissions, ingenuity in rhyming and arranging words in sentences, abilities to draw comparisons and frame definitions and to make practical and esthetic judgments. Perception, memory, imagination, and reasoning ability are emphasized, largely, however, in the field of words and their uses.

Because they depend so much upon the verbal factor, these tests have been critisised. They have also been objected to because their findings are less exact for the early and late years of child life than they are for the middle ranges. They are good tests to apply between the ages of six and ten, but they are less capable of determining mental ability at three and at fifteen, and they yield only doubtful results in distinguishing between adults of superior and average mentality. They can be used to advantage in the middle grades of the elementary schools, but are of small value for the high school pupil. Another serious objection to these tests, if they are to be used in determining the intelligence of large numbers of children, is that they must be administered individually. This requires a long time if a school system, or even a school building, is to be adequately tested. Further, their administration is not a simple matter. No one is competent to give these tests without thorough study of their nature and without training in technique. This ordinarily requires several months of intensive work on the part of the person who plans to give the tests.

In order to overcome this difficulty in the administration of tests, psychologists have recently been working to devise group tests to measure general intelligence. The group tests can be administered to a large number of children or adults at the same time. They require very little training in the technique of administration and they are scored according to very simple and definite rules, thus largely excluding the factor of individual judgment in assigning grades to those tested. A great impetus was given to the work of determining the intelligence of individuals in groups by the tests worked out by a committee of the American Psychological Association and applied to the draft men

in the army. Two sets of tests were ultimately devised, the Alpha Tests, for the purpose of measuring the intelligence of the literates in the army, and the Beta Tests, for the purpose of determining the innate ability of those who could neither read nor write, a surprisingly large number in all. We are here primarily interested with the Alpha Tests, because from these and similar tests are now being compiled group scales for measuring intelligence of children and adults who have a fair knowledge of and skill in the use of words.

I shall not discuss the army tests or in any way comment on their results, except to say that they proved effective for the purposes for which they were designed, separating very readily into groups men of varying degrees of intelligence. Professor Dodge, who follows me, will give you an account of the tests and their significance. Largely because the results of these tests showed the possibilities of their application to various groups in civil life, Professor Thorndike has recently drawn up and standardized sets of psychological tests designed to determine the varying degrees of intelligence among high-school seniors and college freshmen, one purpose of which is to decide whether men seeking admission to college have sufficient native ability to carry successfully to completion a college course. These tests have recently been given at Brown University to about 300 first-year men, with the view of ascertaining as far as possible the varying degrees of intelligence of these men, so that they may be adequately advised in regard to their college work and helped to determine their careers after graduation.

These tests require three hours for administration and consist of five parts: a fore-exercise of ten minutes, in which the students get some acquaintance with the general nature of the tests to be subsequently given; two tests of thirty minutes each, identical in character with the tests in the fore-exercise, but differing in content; a fourth test more difficult in character, occupying an hour of actual work; and a final test, resembling in many ways the one previously given, occupying forty minutes. The fore-exercise and the two following tests are each composed of thirteen sub-tests,

the first of these being a directions test; the second a test in the arrangement of words in such an order as to make sense; the third is a test in the fundamental operations of arithmetic; the fourth, in arithmetical problems; the fifth, a range of information test; the sixth, a synonym and opposites-test; the seventh, a best-reasons test; the eighth, a number-completion test; the ninth, an analogies test; the tenth, a number-checking test; the eleventh, a test distinguishing between true and false statements; the twelfth, a fact-and-conclusions test; the thirteenth, an identification test of geometrical forms, numbers and hieroglyphics. In the fourth main test, the first two sub-tests are silent reading tests; rather difficult paragraphs, such as a student might meet in his general or technical reading are given, and the subject is required to answer questions based on these paragraphs. The next test consists of a number of pictures in which certain parts that are missing are to be supplied. That following is an analogies test, with pictured objects instead of words. The next test is also an analogies test, in which three geometrical figures are given and the fourth is to be supplied which bears the same relation to the third as the second does to the first. The next is a simple algebraic test, and this is followed by an information test relating to mechanical facts and principles. The last test in this series is an extensive range of information test, consisting of sixty items. The final main test has three parts, the first two being rather difficult reading tests, and the last a test in supplying missing words in mutilated sentences.

Another group test which is now available for use is the Otis Group Intelligence Test, consisting of ten parts and requiring an hour for administration. It is designed to be given to children and adults of all grades of school attainment above the fourth. It cannot be given in the lower grades because it requires a fair reading knowledge in order to comprehend it. This test has a number of parts similar to the Thorndike Tests just described. There are two direction tests, one with letters of the alphabet and the other with geometrical figures, beginning with very simple problems and ending with those of considerable difficulty. There

is a disarranged sentence test, an arithmetical problem test, an analogies test, a word completion test, a test identifying proverbs with statements explaining them, and a memory test. This scale, according to the author, has the following general merits: it is capable of being administered to groups of at least fifty; it can be scored rapidly, and is almost entirely free from errors due to the personal factor; the responses required are very simple; there is only one correct answer to each item, and this can be indicated merely by making a letter or a figure or drawing a line; the scoring is done rapidly by the use of scoring stencils; the scale is compiled in duplicate, there being two complete series of tests as nearly alike as possible without using the same materials. This scale is on the whole the best of its kind now available for measuring the intelligence of pupils in the elementary and secondary schools. A new group test is in the process of standardization, and will probably be ready for general use within the next few months. It is being compiled and standardized by a committee of the National Research Council with Dr. R. Yerkes as chairman and with the financial support of the General Education Board. This test is a revision and adaptation of the army mental test and is for use in the schools. As yet, there are no very reliable group tests to measure the intelligence of children in the primary grades. It is difficult to devise and standardize such tests, since the materials used must be pictures and forms rather than words. However, several such tests have already been compiled and used with some success.

The practical value of the tests that have been thus hastily outlined is the question which assumes the greatest importance in the minds of teachers and administrative officers. The query naturally arises: What has been and will be the real value of these tests for diagnostic and prognostic purposes? I cannot at this time enter into a detailed analysis of the results already achieved or of the possibilities for the future. As far as I am familiar with these tests, either in giving them myself or through reading the reports of others who have administered them, I have come to the conclusion that they do show in a fairly definite manner the

general intellectual ability of those tested and form a practical basis for the classification of pupils into groups according to general ability, for diagnosing the particular difficulties in school attainment, and for advising pupils in regard to their scholastic careers.

In conclusion, I shall endeavor to give a few typical instances of the administration of these tests. The first example I shall take from the results of the Terman revision of the Binet Test in some of the Providence schools. Among other things, it was discovered in a group of 1122 children tested that only 285 were in the exact grade at which their mental age should place them; that those who were held back in their school progress were principally to be found among the children of superior intelligence, and those that were forced ahead beyond the grade in which they normally should be according to their mental age were those of inferior intelligence. It was found further, that a close agreement existed between scholarship marks and placement according to mental age. Among those children who were retarded according to their mental age by a year and a half or more, there was not a single D or E, while among those children who according to their mental age were advanced a year and a half or more there was not a single C B or A. It was further found that there was a very definite inverse correlation between mental ability and age-grade, the younger children in a grade being more intelligent than the older children. It is therefore possible in a large school containing several hundred children of the same grade to group them in rooms according to their chronological age. This tends to bring the bright, the mediocre and the dull children together in separate and homogeneous groups. In other instances where the Binet tests have been given to normal children, similar results have been found. There is always a reasonably close agreement between school standing and the results of tests, although there cannot be, and should not be, a perfect relationship, and this for two reasons, even if the tests themselves are absolutely reliable, as they probably are not. The first of these reasons is found in the fact that school marks are seldom exact indications of the

real ability of the pupils receiving them; and the second is that other factors beside general intelligence determine success in school and in life in general. These factors are those of will, attitude, and emotional character. A pupil of mediocre ability may succeed if he is determined and persistent; one of superior intelligence may fail if he is emotionally unstable and irresolute in purpose.

My own experience with group tests has been confined to those administered to college students. However, before discussing my personal investigations, I wish to make brief mention of results obtained by Dr. E. K. Fretwell* in an investigation carried on at Columbia University in connection with pupils in the Speyer School. He gave to pupils entering this school a group of standardized tests similar to those already described, and found that they were very helpful in determining the abilities of these pupils to do work in a Junior High School for boys. In summing up his results he says: "Academic success in the first year of Junior High School was more successfully predicted by a group of standardized tests than by all previous school marks, or age, or teachers' estimates."

Turning to the results that have been secured at Brown University, I shall briefly describe the investigations so far made and their outcome. Last year I gave the first-year men two sets of psychological tests, the Army Alpha Tests, which definitely showed that all the freshmen then in college were in the so-called "officer" group according to intelligence, and a test in two parts called the Brown University Psychological Test, which revealed more in detail than did the Army Tests the ability of the individuals tested, and furnished a rather satisfactory basis for educational diagnosis and prognosis. The Brown University Series consisted of the following sub-tests: two word-completion tests; two vocabulary tests; two opposites tests; two mixed relations tests; a facts-and-conclusions test; and a simple arithmetic test. These tests emphasized principally knowledge of and skill in the use of words, and they were compiled on the assumption that since

*Teachers' College, Columbia Contributions to Education, No. 99 (1919).

students in college have for many years had the opportunity of dealing with words, their meanings and relationships, those that succeeded the best would do so because of superior intelligence rather than because of specific advantages in training. Results seemed to justify this conclusion. "The correlation between the Brown University Tests and the average marks of the first and second terms gives a Pearson coefficient of approximately .6, which is as high as could reasonably be expected when the attenuation resulting from inexact marking is taken into consideration, and when it is kept in mind that factors other than intelligence determine scholastic attainment. . . . During the first half of the year eighty students were reported to me as doing unsatisfactory work. Of these eighty students, thirteen had received a score of good or very good in the psychological tests; fourteen had received an average score; while in the case of fifty-three the score was either poor or very poor. In other words, two-thirds of the men reported had made low scores in their psychological tests, while only one-sixth of the men had a satisfactory grade. In several instances further inquiries were made in regard to those who had been doing poor work in college and who had shown good ability in psychological tests. In those cases thus investigated, it was found that the poor work of the student could easily be explained on grounds other than that of lack of ability.

"During the second term, thirty-four men were reported to me as doing work considerably above average grade. Of those thus reported, five ranked superior in their psychological tests; nineteen, very good; seven, good; two, average; and one, poor."*

During the present year, the Thorndike Comprehensive Tests have been given to all entering students, and also the Brown University Tests to these same men. Sufficient data have not yet been tabulated to indicate in more than a general way the result of this mental testing. Several facts have, however, already appeared. In the first place, the Thorndike Tests show in their distribution of grades a curve that conforms with remarkable exactness to the normal probability curve, and this means that the

*See School and Society, Vol. X, No. 236, pages 27-30, July 5, 1919.

abilities tested, whatever their nature, have been adequately measured. The Brown University Tests likewise show a satisfactory distribution. There is further a close agreement between the results of the Brown University Tests and the Thorndike Comprehensive Tests, indicating that the factor of chance has been very largely excluded, and that the men in most instances have been satisfactorily rated. The success in college work of these men so far has not been definitely determined. The men who took entrance prizes received the following grades in the Thorndike Comprehensive Tests and grades of a similar degree of excellence in the Brown University Tests: 101.6, 97.6, 89.1, 88.4, 87.0, 83.0, 71.2. The lowest mark is not a valid one, because of the fact that the man earning it is a foreigner who is not very familiar with the English language.

In regard to the significance of grades secured in the Thorndike Intelligence Examination, the author says: "Individuals scoring 70 or over possess intellect such as is adequate for college work and may be admitted with no risk of detriment to present standards. Individuals scoring 85 or over may be safely admitted regardless of even gross deficiencies in their representation."

Other facts that have been secured which give some indication of the extent to which psychological tests at Brown are prognostic of the ability of students to do college work, are as follows: Of eighty men reported at mid-term as standing low in two or more subjects, forty-two were below the average in the Brown Tests, twenty-three were at average, and fifteen were above. For the Thorndike Tests, the corresponding figures are: forty below average, twenty-three at average, and fifteen above. In addition, there is a very close agreement between the Brown and Thorndike Tests in respect to the score of these individual men, fifty cases falling in the same quintile in both tests, twenty-seven varying by one quintile, and three by two quintiles. Looking at the matter from another angle, it is to be noted that of the men scoring low in the Thorndike and in the Brown Tests about sixty per cent have so far been reported as doing unsatisfactory work. Doubtless by the end of the semester this number will be considerably increased.

There is good reason to believe from the results obtained from psychological tests given at Brown and at other institutions, both of college and of secondary grade, that they serve *one* important means of ascertaining the scholastic abilities of entering students and their probable success in academic work. It should be emphasized, however, that the findings from intelligence tests alone should not be implicitly relied on in forming the estimate of students' abilities. The previous school record, the estimates of principals and teachers, interviews with those tested, and various other means should also be employed as well. It should be kept in mind, too, that there are other factors beside intelligence that contribute to success in school and life. Unfortunately, at present, there are no reliable tests for measuring such traits as reliability, persistence, honesty, and the like. To sum up in a few words,—psychological tests are a valuable aid in forming estimates in regard to individual abilities, but they should never be blindly followed and should rarely be accepted as final without co-operative evidence of their validity obtained from all possible sources.

The Educational Significance of the Army Intelligence Tests

RAYMOND DODGE, PROFESSOR OF PSYCHOLOGY, WESLEYAN UNIVERSITY.

UNDOUBTEDLY the most important episode in the history of mental testing was the gigantic task of tesing the draft army. That overshadowed all previous achievement, and put mental testing in the limelight. In view of the great practical value of its results in that instance, it can henceforth neither be ignored nor laughed out of court. In both Psychology and Education we are bound to ask what this achievement has contributed to our traditions, as well as what it portends for our future.

Divested of distracting details the Army intelligence test may be best regarded as an instrument carefully constructed by a group of experts, corrected by an elaborate preliminary trial, and standardized by an enormously extended practical use. The nature of the instrument is a kind of mental yardstick, a scale for the estimation of adult intelligence. Let me assume a general acquaintance with its construction.

Eight groups of relatively simple questions, a total of 212, tapped a wide variety of mental processes and common experiences. Under definite limitations of time, correctly answering 135 of these questions marked a soldier as having very superior intelligence; 105 correct answers marked him as superior; 75 as high average; 54 as average, and 25 as low average. Below that to 15 correct answers was rated inferior. From 14 to no correct answers was rated as very inferior.

The original purpose of the test was to help to eliminate from the army at the earliest possible moment those recruits whose defective intelligence would make them a menace to the military organization. From the total of about two million men who were

psychologically examined, 3 per cent were rated below the mental age of ten years. It is probable that none of these men was worth to the army what it cost to train him. One-half of one per cent were so defective as to be recommended for discharge. Three-fifths of one per cent were recommended for development battalions, and about the same number for limited service in tasks that required a minimum of mental activity.

But the military value of an early and reliable estimate of the general intelligence of each recruit proved greater than had been anticipated. In the enormous task of building up an effective army organization it proved important to discover at the earliest opportunity those recruits who could learn the new duties that were required of them as soldiers in the shortest time. To train quick learners and slow learners together in the same companies was an intolerably wasteful process, when every day might make a vital difference in the issue of the war. Moreover, the army needed a large number of men with superior intelligence for officers. While high general intelligence did not guarantee good officer material, it was conspicuous that good officers regularly ranked high in the intelligence tests. In the selection of men for officer training camps mental tests were obviously preferable to the importunity of influential friends. They proved greatly superior to personal impressions.

Furthermore, the various trades represented in the draft made consistent demands not only on physical strength and endurance, but also on that ability to meet new and complex situations which we call general intelligence. We commonly deplore spoiling a first-class mechanic to make a poor executive. Apparently the scientific measurement of general intelligence will go a long way in estimating whether a person has the general intelligence that is required for average success in any given trade or profession.

But it is easily possible to expect too much of mental tests. Prophecy of the future is vastly more difficult than a record of actual developments, even in such relatively simple matters as the weather. The only final indicator of the inability of a person to succeed in a profession is failure; and even a failure may be

the one factor in the complex mental conditions that is necessary for success. In view of the suddenly developed popular interest in mental tests, it is necessary to point out that no so-called mental test is of the least scientific value unless it rests on a scientific analysis of the process to be tested, and unless it has been thoroughly systematized and statistically evaluated in the applications for which it is suited.

Those who were responsible for developing the Army test emphasize over and over again that it must not be expected to apply indiscriminately; and if it is to be used for other purposes than those for which it was constructed, it must be scientifically remodeled. On the other side of the ledger stands the fact that the Army test is today the most thoroughly standardized adult test of intelligence in the world. Approximately two million men, from all sections of the country, from all walks of life, from every nationality that is represented in our complex social structure, with every existing educational and social background, took these identical tests. To fail to exploit these unprecedented data would be a scientific calamity. To fail to get some profit from an experience of such magnitude would be sheer stupidity.

Quite apart from all questions of content, the technical achievement of Major Yerkes and his colleagues is well worth the serious consideration of educators. It seems to be very difficult to construct two college entrance papers so that the grades will be really comparable. To read the examination papers of a class of one hundred men accurately is a difficult and a burdensome task. Few readers would mark the same paper twice exactly the same. No reader would ever mark a paper like any other except by accident. The Army examined about two million men. The papers could be marked by unskilled clerks with a probable error of a fraction of one per cent. The various series were thoroughly standardized and are of practically identical value.

The first technical achievement of the Army test is that of successful group examinations of intelligence. The problem of sifting great numbers of persons with respect to their intelligence

is solved. This technique bids fair to become an essential part of the modern school survey.

But the technical achievement probably reaches further. The high correlation between the Alpha tests and school grades, wherever comparable data are available, raises the question whether our present examination forms with their soul-destroying methods of evaluation are not the result of mental inertia rather than of merit. I am not now speaking of the content but of the method of question construction. The army task was possible only by making the shortest possible answers indicate the maximum of mental fact. Except in the mathematical sciences we commonly ask short questions and wade through pages of more or less successfully camouflaged ignorance to find and evaluate the percentage of information in the answers. With the available data on the art of constructing questions whose answers may be read by stencil, I believe that it would pay each of the school disciplines to investigate the extent to which the burdens of examination reading can be lightened by modern question construction. The use of checks, underscoring, filling in significant words and eliminating superfluous ones, the rearrangement of disarranged sentences, the selection of equivalent phrases, and the indication of relationships, may not all be equally practicable, but in few school subjects would they all be impossible.

A further complaint against our present examination methods is that many examinations test the student's memory without testing his ability to use his information quickly and accurately. In contrast to this the Army test aimed at the ability to apply information, to see relationships, to correctly interpret and to follow instructions, to estimate situations quickly, to collect the relevant intellectual resources, to choose and indicate fitting responses, to discriminate between similar suggestions; in a word, to use the available mental equipment. I believe that a careful study of these technical devices would go a long way towards improving not only the form but the method of our school examinations.

For our present school needs probably the most important technical achievement of the Alpha test was the construction of

a series of papers of the same difficulty. The present disparity of supposed equal tests for college entrance is little short of a scandal. It needs no exposure in this audience. The papers probably seem equally difficult to the experts who frame them. That of course is not significant. Their disparity from the standpoint of the candidates for promotion is not the result of poor judgment, it is the result of sheer mental inertia, sometimes called by a less euphonious name. Methods of calibration of the difficulty of questions for picked groups are neither cumbersome nor difficult.

These technical lessons of the Army tests are after all rather accidental. They are not new. It is their success in the army task that brings them especially to our attention now.

Probably the most obvious and scientifically the best justified educational exploitation of the army tests occurs when it becomes desirable to estimate the mentality of large groups of individuals in terms of relative frequency. The partial elaboration of the Army data has already given valuable information of this sort. The geographical distribution of high as well as of low intelligence in the draft army deserves careful study for its social and educational significance. The distribution of various grades of intelligence in the various trades and professions, in the different racial stocks, as well as in the various strata of our social fabric indicates serious social and educational responsibilities.

The results of the army tests give us the first scientific data on the general intelligence requirements of the various occupations. This data is far from complete or satisfactory. We are a long way yet from a scientific vocational guidance, in spite of common sense and some pretentious charlatanry. But while I believe that there is in its present status more danger than good, any positive data like those supplied by the Army tests make a real step forward.

On the whole I think it fair to say that educationally the most significant promise of the Army tests is in connection with school surveys. As they were originally constructed the Army tests would be applicable chiefly to high schools and colleges, or groups

of a corresponding mental age. A committee of the National Research Council is working on an analogous series for the grades. One can scarcely overestimate the educational usefulness of standardized group tests of this character. They furnish the school surveyor, the superintendent, the individual teacher, or the anxious parent with a reliable instrument for the estimation of general intelligence. For purposes of equalizing classes, of giving special help to those who need it, for estimating the needs of a community, a class, or an individual, such data are invaluable in modern pedagogy.

Standardized tests of intelligence also give the first reliable conditions for a scientific estimate of teaching efficiency. We already have some interesting published data for a comparison of high school and college classes with the draft. Doubtless much unpublished data will eventually become available when their value is realized. All available material of this sort shows that high schools and colleges deal with a highly selected class. It explains the eagerness of Army and Navy personnel officers of the various arms of the service to secure high school and college men, not primarily because of what they had been taught, but because they were intelligent enough to be highly teachable. Various schools and courses apparently select their students with various degrees of care. Excellence in the product of a school, a system, or a teacher means little or nothing unless taken in comparison with the kind of material from which the product comes. Two teachers are not necessarily equally good because their pupils get equal average grades on a common test. It is quite possible that a comparison of the initial capacity of the pupil would prove that one of the two has possessed the genius to bring inferior material to a standard development.

We possess a variety of more or less unreliable indicators of the relative standing of different institutions. After all, the only final criterion of the value of an educational institution is the development it makes in the material that it receives. When that is measured in some demonstrable way the social value of the institution can be estimated scientifically. It is likely to

be quite different from its pretensions, the estimate of partisan advocates, or its popular reputation.

The same difficulty that confronts us in estimating teaching ability and institutional efficiency disturbs our estimates of the value of the various school disciplines and school courses. What would education not give today if it had some record of the general intelligence of those freshmen who later took the full classical course, to compare with those who took manual training, scientific or vocational courses, so that we could estimate quantitatively the results of four years' training in these different lines.

Obviously the intelligence test furnishes education with an instrument that until the present has been entirely lacking. Doubtless the instrument is still quite imperfect, but there is little doubt that we are entering on a new era of quantitative investigation.

One of the most vital and one of the most fundamental of all educational problems, still quite unanswered in terms that education can regard as adequate or final, is the question of the effect of any sort of education on general intelligence. We are profoundly ignorant as to what kind of training in the high school will give a graduate the best development for profiting by a college course, or a technical school, for business or for industrial life. We are reasonably sure of the dictum that if we want a definite habit the only way to be sure of it is to train it. But not all of any life is made up of definite habits. Mentality, guarantees more or less capacity to meet new situations as they arise, to arrive at an intelligent opinion on matters of public policy, to adapt one's self to new environments or to industrial changes, to organize and run intelligently the microcosmic democracy of a home. What kind of school training best develops this general intelligence? On this question we face educational chaos. There is no answer. If we point to the excellence of the graduates of certain kinds of schools or of certain kinds of courses, we have no proper estimate of what part the school or course had in training, and what part it had in selecting excellent stock.

I am not crassly arguing that the present army test will prove adequate to all educational tasks; I do not insist that the army tests point the way to instruments of precision to replace our present guess work and much talking. Furthermore, it seems to me that whatever faults the army tests may have and however we may supplement them for special purposes, the enormous mass of data that is already available for comparison makes it mandatory that we use it intact, absolutely as prescribed, wherever widespread comparisons are desiderata. On the whole, it seems to me that additions and modifications should be embodied in supplementary tests, leaving the standard army series intact for comparison.

I realize that this is only my personal judgment. But as I see it, the value of a scale is directly proportional to the number of persons who use it, rather than to its absolute ideality. It might be convenient to have our inches larger by half, to have 16 pecks in a barrel, etc., but any arbitrary change of scales produces confusion, no matter how excellent the motives. If there is no reduction formula, a change in units is fatal to knowledge. All this does not imply that we do not need new scales, or that we do not need revisions of the army scale. It insists only that in the matter of scales, standards are more important than initiative.

Every complete mental process involves both stimulation and inhibition. This is true not only of perception, attention, and action, but also of judgment. So a complete evaluation of the army tests for education demands that we inquire what they did not do for the army,as well as what they did. Notably the army tests could not pick successful officers infallibly. Neither could they pick infallibly the best privates, or the worst. They could not pick the best men to train for aviators, engineers, intelligence officers, bakers, blacksmiths, or a blessed one of the hundreds of specialties that the army needed.

They made no pretense of doing these things. On the contrary they expressly disclaimed fitness to do them. One doesn't criticize bird-shot because it will not kill a rhinosceros, or a corn-plaster because it will not cure bronchitis. One of the marks of a good workman is the knowledge of what not to use a tool for.

Whoever uses a razor to sharpen pencils, or a plane to cut nails, suffers two disappointments. He is disappointed in the results and in the tool.

The Army test was an instrument to grade intelligence. We all know that intelligence is only one of the factors that condition success as an officer, a teacher, or a man of affairs. How shall one grade the other factors? Some of us were working during the war on just such problems, trying to discover special fitness for special tasks. Possibly, some time in the future, analogous instruments will be devised for grading morale, enthusiasm, loyalty, perseverance, sense of values and the eternal fitness of things, for persuasiveness and suggestibility, for the qualities of leadership, organization, and co-operation, for the power to inspire others and to hold them to great tasks. The army test is not that kind of an instrument and no scale of this sort is available. None is in sight. Furthermore, no scientific estimates are yet available to determine in what proportions these factors must combine with general intelligence, or special intelligence, to insure success as students, engineers, teachers, lawyers, factory managers, or gravediggers. What is worse, we have no satisfactory analysis of the mental constitution into its elementary factors, and little knowledge of how the factors that we do know actually co-operate in any given mental complex.

It is these limitations of our knowledge that make scientific vocational guidance at present impossible, and its pretense a fake. They also make it dangerous to establish any simple formula of routine tests for the capacity to learn any task, military, industrial, or educational. With relative ease one may test actual accomplishment; actual trade ability, as in the army trade tests; actual information or the ability to use it, by suitable standardized tasks, verbal, performance, or combined. But the correlation of accomplishment with the capacity for further development in different or even in related directions is a very different matter. Whenever it becomes necessary to sort large groups of persons quickly for their presumptive ability to handle new jobs, any real indicator of any of the complex conditions of success is better

than chance. Doubtless under such circumstances, if one were limited to a single factor, the most useful measure would be general intelligence. But taken alone in any individual case it may be grossly misleading.

The only final test of the ability to learn to do any specific job is to try it. Even then, success or failure in the first trial does not guarantee that the next instance will end like the first. Failure may be the one necessary stimulus to subsequent success. Preliminary success may, and not infrequently does, invite subsequent failure. In a common-sense, practical way we commonly recognize and provide for these tests by trial. In education we commonly assume that if a boy does well in his high school work he is likely to do well in college, particularly if the subjects are similar. But many a child doing relatively poorly in preparatory subjects blossoms out in college or later as a writer, an executive, a scientist, or some other particular kind of excellence.

School life itself is not merely a period of development of special capacities, and the acquisition of social inheritance; it may be and should be a great test period, in which the child is proving his capacities by the trial and error method.

I believe that education must be on its guard not to be stampeded into dependence on simple tests, where test techniques are, and apparently for a long time to come must remain, very imperfect indicators of the complex factors that make up a human personality. I hope that the time will never come when extrinsic tests, however refined, will take the place of performance tests for any educational preferment. At the present time, no responsible person, so far as I know, has ever recommended the substitution of intelligence tests for performance tests as a criterion for preparation for further school work. Where the intelligence tests are most trusted, as I understand it, they are only used as supplementary data.

For some time it has seemed to me that when properly chosen, and used in connection with other data, there was reasonable expectation of a diagnostic use of mental tests for orthopedic pedagogy. There seems to be no intrinsic reason why the methods

of the psychological clinic should not be adapted to normal teaching. Doubtless every real teacher who watches his students and talks with them personally about life and work, their difficulties and their hopes, serves unofficially as an educational orthopedist. But this is the special privilege of the teacher of small classes in small institutions. Such orthopedic work is probably destined to become more and more the specific task of experts, especially in cases that do not yield to interested and experienced pedagogical sense. But certainly all of us, whether experts or not, need the precise information concerning our students that only suitable tests can supply.

At present such diagnostic tests are far from complete. The army tests are quite inadequate for such a purpose. But in cases of academic deficiency not otherwise clear, it is probable that a first and important step may be taken by the application of a standard intelligence scale. Such a test should decide whether the defect is one of general intelligence or of morale. What should be done to correct defective intelligence or defective morale is quite another story. I doubt if the mental testers as such have any special claim to wisdom.

As it stands, in spite of obvious limitations, the army intelligence test seems to be a useful educational instrument. It demonstrated the practicability of group examinations of intelligence with a maximum indication of mentality and a minimum demand on the examiner. It demonstrated the practicability of constructing equivalent series of examinations of equal difficulty. It is especially useful for surveys of high school and college students. The main advantage of using it just as it stands is the possibility of comparisons with the data from the draft army of approximately 2,000,000 cases. The army scale is at present our only universal scale of adult intelligence.

It should be useful also for the quantitative study of a number of important educational questions, including the estimation of teaching efficiency, of the kind of students taking various courses and entering various institutions and professions; including also

the effect of various courses and kinds of training on general intelligence.

As a factor in determining promotion, educational and vocational guidance, I believe that we should continue to use it and all other extrinsic tests with extreme caution. Actual development is the only final criterion of the capacity to develop.

The Place of Psychological Tests in the Admission of Students to College

ADAM LEROY JONES, DIRECTOR OF UNIVERSITY ADMISSIONS,
COLUMBIA UNIVERSITY.

THE problem of admission to college is a problem of great educational significance. It touches both the school and college. It bears a very intimate relation to the purpose of the college and to the accomplishment of that purpose. It is especially important at the present time.

Attention has been especially fixed upon the colleges because of the record made by college men in the war. We expected that they would be courageous and patriotic, but we were perhaps not prepared to find them showing so extraordinary a capacity for adapting themselves to unexpected situations and so able to use their intelligence in the accomplishment of practical results. Prof. William James once defined intelligence as "the abiliity to deal with novel situations." Colleges are supposed to train intelligence as well as to give instruction.

It is significant that the products of the colleges should have done so well in situations requiring the exercise of faculties which the college is supposed especially to train.

College teachers are not disposed to flatter themselves by thinking that the unusual showing by their former pupils is due wholly, or even to any very great extent, to the efforts of college faculties, though they are perhaps less inclined to regard too seriously some of the criticisms which were so frequent a few years ago. They do not believe that college education is a complete failure whatever criticisms may be urged against it.

They realize, moreover, that the need for training intelligence at the present time and in the future will be greater than ever, and that it is incumbent upon them to do their work with greater

efficiency and to use their own intelligence to better effect than in the past.

They must put their effort where it will count most, and in order to do this, the students with whom they deal must be more carefully selected than in the past.

Everyone knows that a good many students have gone through college who were very distinctly below the mental level which college men should have, and that the effort devoted to trying to educate inferior students means so much energy and time taken away from those who are better worth the effort. Moreover, the presence of inferior students means a slowing down of the work for all.

The question is then, How best to select the students who are to receive the benefit of the greatly improved college education which we hope is to be given in the future?

There are several factors to be taken into account. One is the matter of preparation, and this is one on which emphasis in the past has been principally put. We have asked, What does the applicant know about certain subjects? What has been his accomplishment in his secondary school? Does he know his secondary school work?

These facts are important and do constitute one of the essential elements in making up a boy's readiness for college work. Still it is possible for a boy to have learned his secondary school work well enough to meet the entrance tests and yet be deficient in character and of an inferior grade of intelligence. We all know what a careful tutor can do with very poor material.

We have not wholly neglected the matter of character in the past, though for the most part we have done very little in the way of getting detailed information about the student's moral makeup. We have usually asked some one to certify that he is a person of good moral character, but whether he has the qualities which go to make up a first-rate citizen we usually do not know.

We ought to have definite information on such points. We ought to know the part he has taken in the life of the school, whether he has manifested public spirit, whether he has qualities

of leadership, whether he is persevering and industrious. We want to know whether his moral influence in his school has been for good. We want to know his range of interests, whether he has helped himself through school financially or otherwise.

Both preparation and character are absolutely vital, but there is one other vital factor to which we have given too little attention in the past—and that is intelligence, mental ability.

To be sure, the character of the boy's preparation gives some clue to it but we well know that it is by no means a thorough test. Until recently there were no reliable tests of intelligence, but within the past few years intelligence examinations have been worked out and thoroughly tried.

The papers presented by Prof. Colvin and Prof. Dodge have shown what the character of these examinations is. Just what qualities are shown in any given question in the tests may not be easy to state. Indeed, just what intelligence is, is a thing not easy to say. We know that it implies certain qualities and these qualities are essential for our purpose.

Without attempting anything which pretends to be a definition, let me suggest that intelligence at any rate implies attention, power of attention, ability to discriminate between facts and ideas, a reasonably wide range of information, a comprehension of situations, the formulation of possible solutions of problems, and judging among these solutions. As a matter of fact, we cannot do better in looking for a working definition than to adopt the one suggested above, i. e., that intelligence is the ability to deal with novel situations.

An institution whose business it is to train intelligence should certainly employ every means to discover the extent to which intelligence is possessed by those who come to it for training.

No one would claim that the new intelligence examinations are a final solution to the problem of admission to college. No one would claim that admission to college should be based upon an intelligence examination alone, but it seems to me that it can be said, without question or doubt, that among the requirements for admission to college, the passing of an intelligence examination is one that is indispensable.

The Attitude of the Massachusetts Legislature towards Standards for Degree Giving Institutions

Senator George B. Churchill, Chairman of the Joint Committee on Education, Massachusetts Legislature, 1919.

THE essential features of Massachusetts legislation on this subject, up to the present year, may be stated in a few words. Incorporation of educational institutions and authorization to grant degrees were recognized as two distinct matters as far back as as 1692, when the General Court of the Province of Massachusetts Bay incorporated Harvard College. This act in its earlier sections established the corporation, and then went on: "And whereas it is a laudable custom in universities . . . to confer academical degrees or titles on those who, by their good manners and proficiency as to knowledge . . . have been judged worthy thereof;

"Be it enacted, etc., (Sec. 6) That the president and fellows of the said college shall have power . . . to grant and admit to academical degrees, as in the universities in England, such as in respect of learning and good manners they shall find worthy to be promoted thereunto."

No legislation bearing on the right to grant degrees appears until 1883. Up to this year many institutions were incorporated under the general law and by special acts. Some that were incorporated by special act were also authorized like Harvard to grant degrees. Others were authorized by a later special act.

Some institutions probably *assumed* that their special acts and the general law of incorporation carried by implication authority to grant degrees. For in 1883 was passed "An act to prohibit certain medical societies from conferring degrees." This act

evaded the question of the general right to grant degrees under the General Laws.

Evidently some institutions continued to act in accordance with this assumed right, for in 1893, upon the petition of Harvard College for legislation "to prevent the false assumption for advertising and other similar purposes of the credit or academic degrees of institutions of learning," Chap. 355 of 1893 (R. L. 1902, Chap. 208, secs. 75, 76) was passed, prohibiting "in the broadest terms the conferring of degrees without special authority from the legislature, as well as any false representation in regard to them."*

In other words, it now requires a special act of the legislature to authorize an institution to grant degrees. The penalty for granting degrees without such authorization is a fine up to $1,000, or imprisonment for not more than a year, or both.

The method of procedure to secure such a right was established by Laws of 1896, 1912 and 1914, requiring, *first,* publication of notice of petition under the direction of the state board of education; *second,* "that the board of education shall transmit such petition to the General Court during the first week of the following session, together with its recommendations relative thereto." It should be noted that up to the present year no *standards* whatever for any degree-giving institution had been established by the statutes of Massachusetts, and *that is today the case.* The legislature is at liberty, in the case of any petition that is laid before it, to grant or deny the right in accordance with any standards it chooses at the moment to apply, or upon no standard at all. Since 1912, every such petition has had to be accompanied by a recommendation of the board of education, and that board has been at liberty to apply its own standards in determining its recommendation; but the committee on education in its report to the legislature, and the legislature in its action, have been in no wise bound to adopt either the standards or the recommendations of

*From an unpublished report to the Board of Education by W. I. Hamilton and G. A. Myrick, 1917. I am indebted to this report for most of my synopsis of early legislation on this subject.

the board, and have, in fact, and in the session of this year, disregarded them on occasion.

But in the session of this year, on the recommendation of the committee on education, was passed (Chap. 293, General Acts, 1919) "An Act Relative to the Granting of Degrees by Colleges and other Institutions of Learning," the text of which is as follows:

[GENERAL ACT]

[CHAP. 293.]

AN ACT RELATIVE TO THE GRANTING OF DEGREES BY COLLEGES AND OTHER INSTITUTIONS OF LEARNING.

Whereas, It is hereby declared to be the policy of the commonwealth that no educational institution should be incorporated with power to grant degrees nor should the charter of an existing educational institution be so amended as to give it such power, unless the educational equipment and the maintenance provisions of the institution have been approved by the board of education; therefore, for the purpose of carrying the said policy into effect,

Be it enacted, etc., as follows:

SECTION 1. Whoever intends to present to the general court a petition for the incorporation of a college, university or other educational institution with power to grant degrees, or for an amendment to the charter of any existing educational institution which will give it such power, shall on or before the first day of November prior to its intended presentation, deposit the same in the office of the board of education.

SECTION 2. The petitioners shall give notice of the petition by publishing a copy thereof once in each of three successive weeks in such newspapers as the commissioner of education may designate, the last publication to be made at least fourteen days before the session of the general court at which the petition is to be presented, and the petitioners shall, on or before the first day of January, file with the said commissioner satisfactory evidence that the petition has so been published.

SECTION 3. If the petition is approved by the board of education, it shall transmit the same to the general court during the

first week of the following session, together with its recommendations relative thereto.

SECTION 4. No individual, school, association, corporation of institution of learning not holding degree-conferring powers under a special charter granted by the general court shall use the designation of university or college, but nothing herein shall deprive any educational institution whose name now includes the word "university" or "college' of the right to continue the use thereof. Violation of this section shall be punished by a fine or one thousand dollars.

SECTION 5. Section six of chapter three of the Revised Laws, section one of chapter four hundred and eighty-one of the acts of nineteen hundred and twelve, as amended by chapter fifty-six of the acts of nineteen hundred and fourteen, and so much of section seven of said chapter three as is inconsistent herewith, are hereby repealed. [*Approved July* 9, 1919.

In estimating the value of this act some of its main features require careful consideration. The preamble contains for the first time in the history of such legislation in Massachusetts a declaration of policy to be pursued by the legislature in granting the right to give degrees, viz., that no such right shall be granted unless the educational equipment and maintenance provisions of the institutions have been approved by the board of education. Such a declaration of policy has, of course, no real binding force upon succeeding legislatures. The policy followed by one legislature may be at will rejected by another. The terms of the preamble, also, not being of the nature of statutory provisions, could not be included within the act itself, and the preamble will therefore probably not be included in the Revised Laws of 1920. But the board of education, or rather the commissioner of education, in whom by the Reorganization Act of 1919 the powers formerly held by the board now reside, will undoubtedly feel bound by this declaration of policy to set up standards of equipment and maintenance, in accordance with which his approval will be given or withheld. But the statute does not determine the standards.

The act also contemplates that the board—or commissioner—may refuse to approve the petition, and in that case not lay it before the legislature for action. But it is a grave question whether the petitioners cannot, having fulfilled the requirements of sections 1 and 2 of the act, even if their petition is not approved and transmitted by the commissioner, themselves submit their petition to the legislature, and the legislature act as it likes. The popular right of petition to the legislature guaranteed by Article XIX of the Constitution of Massachusetts (Revised Form) may be held to apply only to petitions for redress of wrongs and grievances, but as a matter of practice no petition for legislation from time immemorial has failed of introduction, and under the present rules of the Senate (S. 25) and House (H. R. 32) it would appear that petitions for the degree-granting power, if due notice has been given, may be introduced by an individual member of the legislature, even if they have been disapproved by the commissioner of education, and when introduced must be acted upon, and in any way that the legislature sees fit. These rules should be revised to conform to the policy and intent of the present act.

Why this act is not more satisfactory and more specific in its provisions, and why the carrying out of its purpose could not be more fully guaranteed, I shall try later to make clear.

If one is to understand fully the present attitude of the legislature as expressed by this act and otherwise, a little more history is necessary. The board of education, compelled, up to the passage of this act, to make recommendations, has long been disturbed by the fact that there are no standards defined by statute, and that therefore it could not present recommendations based simply on evidence as to whether the petitioning institution complied with these standards, but that it must first judge institutions by subjective standards of its own, which standards might or might not be acceptable to the legislature, and that thus there might arise "an unfortunate appearance of hostility between the board and the legislature, when, as a matter of fact, both are acting in good faith but on different grounds." It has sought, there-

fore, to secure statutory standards on which both board and legislature could base their judgment.

In various reports on this matter to the legislature it has indicated its notions of what these standards should be. I quote part of one of its fullest reports (on Suffolk Law School, 1914, from "Portia Law School," H. R. 1418 [1919], p. 3). In this the board declares:

"That any institution asking authority to grant any of the degrees which are standard in general or professional education should not only present sufficient evidence of the present adequacy of its standards, methods and ideals, but should also be in a position to make it reasonably certain that it will continue to be able to maintain standards in conformity with the best educational traditions of the commonwealth.

"That the history of education seems to demonstrate that an institution, to be reasonably certain permanently to maintain proper standards as to requirements for admission, character of courses and standards of graduation (and in none other should the power of granting professional degrees be vested), must have the advantage and support of at least one of the following conditions, namely: (1) a resident faculty whose chief purpose it is to give instruction required by the institution, and who will have a professional incentive for upholding and advancing its standards; (2) an adequate endowment, in order that the institution shall be free, at least in some measure, from such pressing financial necessities as may tempt it to lower its educational standards; (3) affiliation with other institutions of higher learning; (4) supervision by authority directly responsible to the state and not financially interested in the institution."

Other desirable requirements on which the board has dwelt at various times are:

1. Provision for the revocation of charters not made use of by the institution to which granted.

2. Provision for such reports and supervision as will enable board and legislature to know whether an institution *continues* to conform to the prescribed standards.

3. Provision for revocation of charter or of authority to grant degrees of an institution that does not continue to conform to standards.

In the legislative recess of 1918, a Special Commission on Education, composed of members of the legislature and three men from outside appointed by the governor, made a survey of the educational situation in the state and reported its findings and proposals for legislation to the legislature of 1919. On this matter it reported as follows:

"Incorporation of Educational Institutions and Degree-Granting Privileges.

After careful study it has seemed to the Commission that greater discretionary power with reference to the incorporation of, and the conferring of degree-granting privileges upon, educational institutions in Massachusetts should be placed in the hands of a responsible educational body. It is reasonable to assume that the Commonwealth should further safeguard its interests in these matters, as it has in the past been a comparatively easy matter to secure a charter, and, without adequate endowment, equipment, and faculty, to found an educational institution.

The incorporation of an institution to engage in educational work is very different from the incorporation of a business enterprise. Massachusetts has not clearly enough differentiated these matters in her existing laws. An institution may comply with all the requirements of the law regarding incorporation and so secure a charter, and still be unable to furnish adequate educational opportunities.

Private educational institutions have in some instances employed the name "Massachusetts" in such a way as naturally to confuse the average citizen, and in some cases the Commission has learned that citizens have labored under the belief that a private institution with "Massachusetts" affixed to its corporate name actually was a state institution. The Commission believes that the conditions surrounding the foundation of higher institutions of learning should be such as to make impossible a situation of this kind.

The Commission recommends that any private educational institution now using the name "Massachusetts" should have its charter amended, or take such other steps as may be necessary to a change of name.

Recent legislation in several states has given considerable attention to the preliminary requirements with reference to incorporation and degree-granting privileges as affecting educational institutions. These requirements cover such matters as an adequate endowment, buildings, libraries, laboratories, and the employment of a properly qualified faculty.

In Massachusetts all of these details might reasonably be insisted upon as necessary to guarantee the continued existence of an educational institution on such a plane as to insure its being able to furnish in the future the same quality of education as should be insisted upon at the time it secured its privileges from the Commonwealth.

The Commission believes, therefore, that before an institution is incorporated or given the power to confer degrees, its equipment and educational program should be passed upon and approved by the State Department of Education. In the Appendix, pages 169 and 170, the Commission submits an act embodying the foregoing recommendation."*

The bill which the Commission recommended is as follows:

AN ACT RELATIVE TO THE GRANTING OF DEGREES BY COLLEGES AND OTHER INSTITUTIONS OF LEARNING.

Be it enacted, etc., as follows:

SECTION 1. Whoever intends to present to the general court a petition for the incorporation of a college, university or other educational institution with power to grant degrees, or for such an amendment to the charter of any existing educational institution as will give it power to grant degrees, shall on or before the first day of November transmit such petition to the office of the board of education.

SECTION 2. The petitioners shall give notice of such petition

*Report of Special Commission on Education, 1919, pp. 59, 69.

by publishing a copy thereof once in each of three successive weeks in such newspapers as the commissioner of education may direct, the last publication to be made at least fourteen days before the session of the general court at which the petition is to be presented, and said petitioners shall, on or before the first day of January, transmit to the commissioner of education satisfactory evidence that the petition has been published in accordance with the provisions of this section.

SECTION 3. The board of education shall transmit such petition to the general court during the first week of the following session, together with its recommendations relative thereto.

SECTION 4. No institution shall be incorporated with power to grant degrees, nor shall there be an amendment to the charter of any existing institution conferring upon it the power to grant degrees, unless it shall have assets in buildings, grounds, equipment, endowment and other resources amounting to at least two hundred thousand dollars, and no educational institution of higher than secondary grade shall be incorporated unless its provisions for educational equipment and maintenance have been approved by the board of education.

SECTION 5. No individual, school, association, corporation or institution of learning not holding degree-conferring powers by special charter granted by the general court shall confer any degree or transact business as, or in any way assume the name of, a university or college, under a penalty of a fine of one thousand dollars for each offence.

SECTION 6. This act shall not deprive any educational institution whose corporate name now includes the words "university" or "college" from continuing the use thereof.

SECTION 7. All acts and parts of acts inconsistent with this act are hereby repealed.

You will note that this bill differs in two important respects from the act which was reported by the Committee on Education, —three members of which, by the way, had been members of the Special Commission,—and which was passed by the legislature of 1919.

1. It keeps the provision of the previous law that the board of education *shall* make recommendation of approval or disapproval to the general court.

2. That it specifically and definitely sets a statutory standard of at least $200,000 worth of assets in buildings, grounds, equipment, endowment, and other resources.

That is, it submits every petition, whether approved or not by the board of education, to the legislature for its decision, but forbids the legislature to grant to any institution authority to give degrees unless it have $200,000 in material assets, and unless the board of education approve its provisions for educational equipment or maintenance. I hardly need to say that these provisions would hold good just as long as the legislature chose to observe them, and no longer. One year's legislature cannot bind another, and at any moment, if the legislature saw fit, it could approve the petition of an institution that did not conform to these provisions. The commission would have left to the legislature the ultimate decision, while recognizing at the same time its incompetency to pass on the proper educational equipment and maintenance, or on much of anything save the question of fact whether the institution actually had $200,000 in assets. At the same time it pronounced that no institution ought to have the degree-giving power, whatever its other resources, if it did not have $200,000 in material assets.

For such a provision it found examples in the laws of Pennsylvania and New York. The Pennsylvania and New York laws require assets of $500,000. And such a provision does, of course, go far to ensure the stability of an institution and its continued conformity to the standards upon which is given the degree-conferring power. But in both states it is also required that there shall be at least six professors, a four years' course for the degree, and adequate standards for admission. Further, in Pennsylvania the incorporating power is not the legislature but the courts of common pleas, which may not incorporate without the approval of a so-called "College and University Council"; and in New York, educational institutions are chartered by the Regents of the State

University. In short, the specific requirements of the statutes are imposed on the institutions and incorporating educational bodies, and not by the legislature upon the legislature itself.

The bill of the Special Commission brought the most important questions at issue sharply to the attention of the Committee on Education.

1. How far should the statute go in laying down specific requirements as to amount of material assets; and as to faculties, length of courses, and other matters that may be grouped under "educational equipment and maintenance"?

2. Shall the authority to grant the degree-giving power continue to be exercised by the legislature or be placed in the hands of a responsible educational body like the board of education, or shall it be shared by the two?

It is clear that the answer given to any one of these questions greatly affects the answers to others.

If the Committee on Education and the legislature could be induced to transfer the incorporating and degree-authorizing power over to a competent and responsible body like the board of education, the chief and real difficulty would be met. Upon that body could be laid statutory requirements with the assurance that they would be fulfilled and that they would last.

But such a delegation of power was impossible. The Massachusetts legislature does not easily yield up any power whatever. "Drest in a little brief authority," the ordinary legislator is very jealous of all the authority and all the semblance of authority that he has. He distrusts the executive boards and commissions, and prefers his own ignorance and incompetence, though he sometimes recognizes it as such, as a basis of action, to giving the power of action to a well-informed and competent administrative body. He will tinker the game laws, the prison laws, the charity laws, the educational laws forever, and load the statute books year after year with a fluctuating mass of legislation unstable as the waves of the sea, rather than give an administrative body that knows its business, power to deal by rule and ordinance with what it is the most competent to understand. Ignorance—the inevitable ignor-

ance which all legislators share regarding hundreds of matters on which to legislate competently requires expert knowledge and special experience—and jealousy of power are the chief faults of the Massachusetts legislature, as of other legislatures. And underlying all this is that profound feeling, which is in practice both the preserver and the destroyer of the common welfare, that legislation must be openly arrived at, and passed by a body as close as possible to "the people." I hardly need to say to you that it is in feeling that the work of the demagogue finds its most fertile soil, and that because of it, in the sacred name of "the people" the welfare of the people is often neglected and the selfish interests of a few are often preferred by the people's agents.

What this means in the matter we are discussing may perhaps best be made clear by what happened to two bills in the last session of the legislature.

The first was a bill to revoke the authorization of a certain medical college to grant the degree of M. D. It is a very small school, with few students, most of them poor, an inadequate faculty, very ill-paid, and very slight laboratory equipment. Its general condition is sufficiently indicated by saying that its total annual expenditure for all purposes is about $3,000, of which the teaching faculty receives something over half. It has, during its history, graduated a few men who have taken excellent standing as physicians, but most of its students have a poor general education and they find great difficulty in passing the state examination for admission to practise. So bad was the case for this institution that it was referred to the legislature by the Attorney General of the state, and much of the testimony against it was furnished by the state police and the legal authorities of Suffolk County. The Committee on Education at the session of 1918 investigated the matter and gave the college a sharp warning of necessary reform. When, in the next legislature, the matter was again taken up, it was found that conditions had not perceptibly improved. Only one member of the faculty could testify that he had made any attempt to improve the work of his department. The authorities either could not or would not try to improve; and

on the part of those in control there was manifested something like defiance of the Committee on Education. In this it would appear that they were justified; for when the committee reported favorably the bill to revoke the college's degree-granting power, it was overwhelmingly defeated in the House of Representatives.

The cause of its defeat was plain. On the floor of the House the cry was vehemently, not to say violently, raised that the institution is the medical college of the poor boy, who cannot afford to obtain his professional training in the schools of the rich, that the bill was a tyrannical, "capitalistic" attack of the wealthy and entrenched institutions and authorities upon the professional education of "the people." Much more effective than this argument even, was the lobbying of a certain buxom and blooming young lady, a student at the college, who for weeks perambulated the corridors of the State House, "clothed in white samite, mystic, wonderful"—or its modern equivalent, not quite so mystic, but just as "fetching"— and with soulful, pleading eyes and heaving breast, besought the susceptible legislator not to vote to kill *her* beloved institution. The combination of Charlestown, South Boston and the Venusberg is hard to beat!

The second bill was one to give the degree-granting power to an evening law school for women. This is a school maintained in three rooms in one of the office buildings of Boston, unaffiliated with any other institution, without endowment, dependent on its tuition fees, and without any material guarantee for its future. The board of education disapproved its petition, on grounds some of which have already been set forth in this paper. But in the hearings before the committee, and in its visit to the school, it was made evident that the faculty is at present able and competent; that though the school may be said to be maintained for its financial return, its teachers are doing faithful and efficient work and its students are receiving a legal education at least equivalent to that given by some other law schools that have the right to grant degrees. A majority of the committee voted to report the bill, and it was passed by the legislature.

The state of mind, the attitude, which I have thus described

and illustrated, is responsible for the form and the deficiencies of the act relative to granting degrees which was submitted by the Committee on Education and which is the law today.

To make the board of education the incorporating and degree-authorizing power was impossible—though in the minds of some of us that is the proper solution of the difficulty. To lay down specific requirements as to material assets, faculty, courses, preparation for admission. etc., was likewise impossible. Too many members of the committee and of the legislature put first in their minds the work which they judge the institution to be doing at the moment, and the question whether the students served are "high-brow" or low-brow," of the "well-to-do" or "the poor." Nor do such specific requirements, many of which are in detail difficult to establish wisely, and likely on various occasions not to be of exclusive or even first importance, seem of such value when they are laid upon the legislature itself, which may at any time and in any specific case overturn them.

The most that could be attained, and I often wonder how we attained that—the answer is, probably, that the attention of the legislature was concentrated on other bills of the committee—was a mode of procedure that would make the approval of the board of education necessary before the legislature could act, and to declare such procedure the policy of the commonwealth. The important question of the revocation of charters and of the degree-giving power was left untouched. To have introduced it would almost certainly have defeated the whole measure.

The defects of the bill I have already pointed out. It is good so far as it goes, and so long as it lasts. I hope that for some time no petition may be presented and disapproved by the Commissioner of Education which the parties may be minded to seek to take to the legislature over his head. Meanwhile, I have perhaps said enough to bring home to you that so far as Massachusetts legislation is concerned, what we say among ourselves in an organization like this is of but slight importance. Satisfactory legislation can be attained only by the education of the legislature, and that chiefly by the education of their constituents. I hope to

see the day when every organization like this will recognize it as a large part of its duty to try to bring home its conclusions to the intelligence and consciences of the people, to "popularize" its ideas, and to enter "practical politics." I have never been able to understand why men of intelligence, experts in other things than those which we call "business," unlike those who are expert in matters of business, are so ready to leave the legislation they desire to the mercies of legislators who are of necessity uninstructed and inexpert.

I hope some time to solve the question whether the deficiency is in their intelligence, their wills, or their conception of good citizenship, or perhaps in all three. But of one thing I am sure, we can never have satisfactory educational legislation in Massachusetts, on this matters or on others, till the educationists, all together, really want what they think they want, make up their minds to pay the price in time and effort and courage, and go out and get it.

Community Organization For Vocational Guidance

REPORT OF THE COMMITTEE, TO THE NATIONAL VOCATIONAL ASSOCIATION OF THE UNITED STATES.*

MEMBERS OF THE COMMITTEE:

Josiah Bradley Bueil, *Chairman.* Division of Industrial Studies, Russell Sage Foundation, New York.
Anna B. Pratt, White-Williams Foundation, Philadelphia, Pa.
George Chatfield, Bureau of Attendance, New York.
Beatrice Doerschuk, Bureau of Vocational Information, New York.
Edward Rynearson, Director of Vocational Guidance, Pittsburgh, Pa.
E. W. Weaver, Teachers' College, New York.
Florence R. Jones, Director, Vocational Guidance Bureau, New York.
W. Carson Ryan, Bureau of Education, Washington, D. C.
Margaret Brown, Vocational Scholarship Committee, New York.
Mrs. Alice K. Pollitzer, Director, Junior Employment Service, New York.
Merle Higley, Interchurch World Movement, New York.
Emily A. Howd, Assistant Principal, P. S. 89, Brooklyn.
Mrs. Virginia Ake Drew, Commercial Department, Washington Irving High School, New York.
M. Gertrude Godfrey, Department of Vocational Guidance, Philadelphia, Pa.
Ruth L. Clark, Ph. D., Psychologist, Vocational Guidance Bureau, New York.

As a result of its consideration of practical procedure in organizing a community for vocational guidance, your Committee desires to report on the following points:

*This Report is not a part of the proceedings of the N. E. Association of Colleges and Secondary Schools. It is submitted to our readers by request of the Chairman of the Committee on Vocational Guidance, and with the feeling on our part that it presents a subject of great interest and one that is quite in harmony with the discussions which make up most of the body of this number of Education.—*The Editor.*

I. We are impressed with the necessity for having an ideal towards which to work, as well as a program for practical accomplishment. At a given time and place the exigencies of a local situation will and should determine immediate methods and policies, but without a clear conception of the objective desired, practicality must defeat its own ends. In its broadest aspect all juvenile guidance and employment work should aim to render to the child the greatest possible degree of assistance, not only in his educational choice, but in his efforts to secure real and practical opportunities in the industrial world. Its purpose should be to make education more truly effective by bringing the child, both during his school career and the early years of his working experience, in contact with the widest opportunities for choice and development. This is essentially an educational ideal, and it follows that the broader the experience of those giving actual instruction, the more intimate their contact with industrial conditions on the one hand, and their familiarity with the child and educational facilities on the other, the less will be the need for specialized machinery to accomplish this purpose. Towards such an end your committee believes every community should work—to bring together its industries and its educational system, so as to make available to each individual child the maximum of opportunity, both in the school and in his later life.

II. It has seemed obvious that certain functions, often, it is true, inadequately performed, but nevertheless with which we have already had considerable experience, form a basis for the practical achievement of this purpose:

1. School census attendance records furnish scientific information, not only about individual children, but supply the basic statistics on which the school organizations rests;
2. Psychological tests likewise aid, not in determining the abilities of the individual child, but in pointing out the educational needs of specific groups;
3. School scholarships enable children who would otherwise be deprived of such opportunities, to continue their education and growth;

4. School social case work aids those whose homes entail an environmental handicap;
5. The importance of regular physical examination and medical care is everywhere recognized;
6. The administration of child labor laws and compulsory continuation school laws provide safeguards for the transition period between school and industry;
7. Industrial surveys provide adequate information concerning occupational needs and opportunities for the child himself as well as for those who are working with him;
8. Educational and vocational guidance, on the one hand, assist the child approaching the age at which school attendance is no longer compulsory;
9. Placement, i. e., practical assistance in securing a position, on the other, assists the child who must or should leave school;
10. Finally, follow-up guidance and replacement continue the work for the first few years of the child's industrial life.

These are the basic activities through which vocational guidance must be developed.

III. It has seemed further evident that in any city the following must all be carefully considered before the details of an immediate progress are determined upon. They could not, however, materially affect the main outline and purpose of that program.

1. The size of the city.
2. The number of school children.
3. The organization of the school system (elementary, vocational, continuation, junior high schools, high schools).
4. The local educational and child labor laws.
5. The character of the local industries.
6. Existing social and public agencies concerned with child welfare.

IV. The first step, therefore, for a community desiring to organize its juvenile guidance and employment work should be a survey sufficiently adequate to bring out the essential characteristics of its industries and its educational facilities and to evalu-

ate all the work being done in the fields indicated in Paragraph II, by either public or private agencies.

V. The second step should be the co-ordination of such work. Your committee believes that if a community went no further than to organize a central committee on which could be represented all public and private agencies doing family case work, attendance work, issuing employment certificates, placing juveniles, giving vocational guidance, psychological tests, and the like, an important initial step would have been taken.

VI. While, in most communities, public health authorities do give medical care, the school administration does look after truant cases and keep school records, and either the educational authorities or private agencies attempt to meet the need for vocational guidance, placement or school case work, and in a few instances an all-round program has been projected, we know of no community where it has been adequately developed. As a basis for effective growth, therefore, we recommend the organization of a central Vocational Guidance and Employment Department under the Board of Education. At the head of this Department should be a Director responsible to the Superintendent of Schools. His first task should be the correlation of the attendance, census and other school work with that of outside agencies, and a means for this accomplishment might well be a central Advisory Committee, on which would be represented social and health agencies, employers' associations, labor organizations, parents' associations, or any other bodies directly concerned with the welfare of the child.

VII. Within the Department there should be the following divisions:

1. Permanent census and attendance.
2. Educational scholarships.
3. Psychological service.
4. Information, research and training.
5. Guidance, placement and employment certification.

VIII. The staff required for each division and the method of administration are problems for local determination. By the nature of the case it would seem as if the work of the Division

of Census and Attendance, of Educational Scholarships, Psychological Service and Information, Research and Training, should be mainly carried on in the central offices of the Department.

IX. By the nature of its work, again, the Division of Guidance, Placement and Employment Certification, should be more closely and continuously in touch with the schools and the school children themselves.

A. Under the direction of the Division there should be in the schools sufficient counsellors to give intensive service to those children approaching the period of differentiation or withdrawal.

Counsellors should have knowledge of the child based on (1) personal acquaintance, (2) a cumulative record, including physical and psychological reports, teachers' estimates and school record, which should follow the child through school and be filed in the Central Bureau at his withdrawal, (3) social facts gathered from the attendance officers, school case workers, or other agencies.

Familiarity with various educational facilities in the community is equally essential.

The counselor should have knowledge of industry based on (1) a general understanding of the factors involved in industrial relationship, (2) information about local occupational opportunities from the Division of Information, Research and Training, (3) personal contact with employers and processes.

Counsellors should co-operate with and seek the assistance of persons in their locality who are able to give advice to and make contacts for children desiring to enter particular occupations.

B. With organized juvenile placement we have had little satisfactory experience. Informally, much excellent work has been done through the schools by principals, teachers or counsellors. Formally, both public and private organizations have had noteworthy experience with junior employment bureaus. In a smaller community, or even in the high schools of a large community, the counsellors, with their knowledge of the child and of industry, might naturally combine guidance with actual placement, replacement and follow-up. Where the administrative problem makes placement through a central bureau necessary, that bureau

located in the offices of the Division should be in closest touch with the counsellors giving guidance. Placement might be done through a central bureau at which each school counsellor spent one or two days a week. In any case, assistance to the child during this period of transition between the school and industry, must be based equally on a personal acquaintance with the child and his characteristics and an intimate understanding of industry and its opportunities.

C. It seems obvious that applications for employment certificates ought to go through the hands of and be finally approved by those responsible for the guidance and placement of the particular child, although final issuance should be through a central office. Medical examination by physicians within this division should be given before each issuance of employment certificates. A certificate for each job is strongly recommended. Application in person by the parents, as well as the child, for the first certificate has proved successful in some states.

X. The evaluation of the success of such a department should depend more on the quality than on the quantity of its work, and this should be definitely a part of the work of the Division of Information, Research and Training. It is not unreasonable to expect, however, that such a Department would (1) increase the percentage of children who remain in school after the compulsory attendance age, (2) increase the number entering specialized vocational schools, (3) make possible the classification of children for instruction according to their innate ability, (4) stimulate the development of additional needed courses within the curriculum, (5) decrease the number of children entering and remaining in jobs which offer no incentive to advancement, and conversely (6) increase the number who find opportunity for such advancement, (7) increase the demand for vocational information by teachers, students and parents, (8) stimulate the interests of the entire community in the solution of the problem.

American Notes—Editorial

For several years EDUCATION was honored in being chosen as the "Official Organ" of the New England Association of Colleges and Secondary Schools. The subjects discussed by this leading New England educational organization at its annual meetings have always engaged the attention of the educational world, partly because of their intrinsic interest, and partly because the Association has always been able to command the services of distinguished educators to lead in these annual discussions. From the meeting held in 1910 to that of 1917 EDUCATION was asked to reprint these addresses Owing in part to conditions produced by the World War, the Association decided not to reproduce in print the discussions of the meeting held in 1918. The program of the 1919 conference, however, is presented to our readers in this issue. We are sure that the addresses, both on account of their intrinsic interest and the high standing of the speakers, will receive a wide reading.

Throughout the country the agitation of the subject of teachers' salaries continues "at white heat." It is debated and discussed at gatherings of august bodies of college and university authorities, at superintendents' meetings, at state, county and local teachers' associations, at schoolmasters' clubs, and at city and town school boards' meetings. There seems to be but one opinion on the matter, so far as the main question is concerned. It is universally conceded that teachers' salaries are altogether too low. They have been increased already,—and very considerably,—in many places. The matter has not been overdone, and it has not been done at all in a large number of places. It will have to be, or teachers will be unavailable for such places. Already, in some rural districts farms have had to be abandoned since schools had to be closed for lack of teachers. Normal schools are receiving very small quotas of candidates for training for the profession. Large numbers of teachers of all grades, including teachers in high schools and colleges and even professional schools, are resigning, to take up business and administrative positions that pay living wages. The agitation has brought out other obnoxious conditions that beset the profession of teaching, such as undue interference (meddling) on the part of school boards, social ostracism or indifference, excessive amounts of out-of-school work on examination papers, theme revision, etc., and the lack of housing and boarding accommodations. With this entire movement we are wholly in sym-

pathy. EDUCATION has contributed its mite to the presentation and discussion of these troubles. It believes in the teacher as the very heart of the school, and it knows that the American people do really, deep down in their hearts love and admire the American school teacher and want to deal both justly and liberally with the schools, —from the kindergarten to the university. The school and the church have been, still are, and ever will be, the pillars upon which rest our democracy and our hope of national security and prosperity. The public only needs to be shown that it has been a bit thoughtless and careless and absorbed in other, perhaps more conspicuous and tangible concerns than the quiet and matter-of-course process of the education of the children. It is being gradually shaken to wakefulness upon the subject of the school and the school teachers and it will do the square thing as the matter becomes visualized in its consciousness. We have begun the good work, and if the teachers keep on, and keep their heads, and keep reasonable in their demands, they will get what they ought to have. We do not believe that they will be stampeded. We do not look for a permanent and general defection. We expect to see, and that right soon, the refluent wave that will fill the vacancies in the ranks, supply the rural districts and the cities with competent teachers and instructors, and raise the average of efficiency higher than ever, in all our educational institutions. To change the figure we await the return beat of the pendulum.

Having expressed ourselves thus somewhat optimistically upon the general situation, we wish to say an additional word directly to the teachers,—at least to those who believe, theoretically, that teaching is a "calling" worthy of the best ability and consecration that they can bring to it. We would say to such: "Listen to that 'call!' Do not be turned aside by any weak misgivings or widely advertised bugbears." Teaching is, and always has been, one of the very greatest of all callings. The only perfect man humanity has known called himself "Teacher," and has been known to the world for twenty centuries as the greatest of all teachers. There are satisfactions in the teacher's lot which are beyond all price. They compensate,—in the estimation of one who has heard and answered the call and become a real teacher,—for all that is lacking in mere environment and material recompense. They enable him to make a complete and joyous consecration of himself to this work, and to stay in it, and do his duty, and patiently wait for external recognition and reward, or to go without these if necessary.

It is this kind of a "call" to be a teacher which should be stressed at this hour. The true teacher should catch the same vision of duty

and privilege as that which is the impelling motive and inspiration of the minister and the foreign missionary. He should face the hardships of his profession in the same spirit as they do, counting it all joy that he is privileged to do the grand and noble work of teaching. This vision of the greatness of his work should carry him over the littlenesses and difficulties of the everyday routine. He should find his satisfactions within, even when outward conditions are the hardest. It is this that will always make the profession worth while. This spirit in the rank and file of the teaching force in any community will not only bring to the teachers the greatest contentment and satisfaction; it will also win for the profession, more speedily than anything else will, a just appreciation and an adequate reward at the hands of the people.

We are in receipt of the prospectus of the "Registration Bureau of the California Teachers' Association," together with the endorsement of the same by "The Sierra Educational News," in which the claim is made,—incorrectly, we believe,—that California is the first state in the nation to organize and carry on the work of bringing together available teachers and school vacancies. We are sure that a number of other states, through their Boards of Education and Normal Schools, are doing this very thing. The Massachusetts State Board of Education, for instance, has for some time past regularly registered candidates for service, at its offices in the State House, and has notified superintendents, encouraging them to utilize these lists. All of the eight Normal Schools in Massachusetts, and also some of the city normal and training schools do much toward placing their graduates in teaching positions. This is true also of the colleges and universities. We approve, heartily, of any and all legitimate means employed to promote the welfare of teachers, their educational advancement, and the elevation of the standard of teaching efficiency; but, *a priori* and *a posteriori*, it is not clear that the influence of State Boards, Normal Schools and Colleges is inevitably in the interests of their immediate constituents; while a well organized teachers' agency, with a wide outlook, considers impartially, not simply local candidates and conditions, but makes it a matter of business to take cognizance of available material and special needs of all sections of the country, and indeed, of the entire world. Doubtless Massachusetts, California, and other states may render valuable service through Boards of Education, Normal Schools and Colleges, in placing their graduates. But, as a matter of fact, they do this in large measure through co-operation with expert agency men, whose judgment, experience and interest are not limited by any institution or section of

the country and who are specialists, in the best sense of the word, in serving both teachers and employers.

Classes for conservation of vision have been formed in a number of cities in several states, and have continued long enough to have passed the experimental stage. The question of establishing such classes in the public schools throughout the United States has become of such vital interest, and inquiries concerning methods of procedure, equipment, selection and training of teachers, standards for entrance, etc., have become so numerous, that there is an evident necessity for a handbook on the subject. An extensive study has therefore been made by the National Committee for the Prevention of Blindness, and a manual prepared in non-technical form. Those who have informed themselves of the need of provision in the educational process for meeting the requirements of an unfortunate group—neither blind nor yet wholly competent from a visual standpoint—are of the opinion that this manual should be in the hands of every state and city superintendent of schools, principal, and teacher interested in sight-saving classes. The "Manual for Conservation of Vision Classes" will be sent postpaid to any address on receipt of fifty cents. The committee is, like the Anti-Tuberculosis Society and other associations, purely philanthropic. While a charge of fifty cents per copy is made for the Manual, this is intended to meet only half the cost of production, the remainder being met out of the committee's funds. Applications should be addressed to the committee at 130 East 22nd Street, New York, N. Y.

The National Physical Education Service has announced the opening of a country-wide campaign in behalf of a national physical education law. The Service has decided upon the provisions of a congressional bill, around which will center an educational movement of national scope. This bill would enable the boys and girls of the United States to be more thoroughly prepared for the duties of citizens through development of their bodily vigor and endurance. The system, which would go into effect upon passage of this bill, would provide comprehensive courses of physical training, periodical physical examinations, correction of defects, health supervision of schools and school children, practical instructions in the care of the body and in the principles of healthy hygienic school life, sanitary school buildings, playgrounds, and athletic fields and equipment. We hope that politics will play no part in legislation on this movement. It is manifestly one which should be carried forward on its own merits.

The Carnegie Corporation of New York has announced its purpose to give $5,000,000 for the use of the National Academy of Sciences and the National Research Council. It is understood that a portion of the money will be used to erect in Washington a home of suitable architectural dignity for the two beneficiary organizations. The remainder will be placed in the hands of the Academy, which enjoys a federal charter, to be used as a permanent endowment for the National Research Coouncil. This impressive gift is a fitting supplement to Mr. Carnegie's great contributions to science and industry. The Council is a democratic organization, based upon some forty of the great scientific and engineering societies of the country, which elect delegates to its constituent divisions. It is not supported or controlled by the government, different in this respect from other similar organizations established since the beginning of the war in England, Italy, Japan, Canada and Australia. It intends, if possible, to achieve in a democracy and by democratic methods the great scientific results which the Germans achieved by autocratic methods in an autocracy, while avoiding the obnoxious features of the autocratic regime.

The Seventeenth Annual Convention of the Religious Education Association, at Pittsburgh, March 18 to 22, will be devoted, principally, to the discussion of present-day propaganda, its dangerous tendencies, evil effects and good possibilities. As usual this Association presents a timely, forceful program, in which some seventy-five leaders in religion and education participate in various aspects of the theme, "The Formation of Public Opinion." The principal meetings will be conducted by The Council of Religious Education; at these the reports on investigations into the extent and methods of influencing public opinion through propaganda and other forms of control will be presented. At other meetings various phases will be presented of the work of churches, colleges and universities, church schools, community agencies, week-day schools, and other means of religious training.

Book Reviews

EDITOR'S NOTE:—

So many books are sent to this department of EDUCATION that it is impossibleot review them all. Naturally we feel under obligation to give preference to the books ef those publishing houses which more or less frequently use our advertising pages. Outsido of the limitations thus set, we shall usually be able and glad to mention by title, authors publisher and price, such books as are sent to us for this purpose. More elaborate notices will necessarily be conditional upon our convenience and the character of the books themselves.

THE ESSENTIALS OF PSYCHOLOGY. By W. B. Pillsbury, Professor of Psychology, University of Michigan. The Macmillan Company.

This is a revised edition of a text book on psychology that has been widely used as a classroom manual. Books upon the subject need constant revision, because knowledge of the mind and its laws is so rapidly expanding. The volume is intended for beginners and therefore includes a brief exposition of the nervous system and its functions. It defines psychology as the science of behaviour, and proceeds to discuss human behaviour. It is pointed out that in industry an understanding of how human beings will behave is quite as important a matter as to know the laws for the production of energy in the engine room. The hope of further progress in many industries lies rather in the direction of "increased knowledge of the human instrument than in further perfection of machinery." This idea of the relation of the study to efficiency is kept in view, without unduly emphasizing the merely practical. Sensation, selection and control, perception, memory and imagination, reason, instinct, feeling, action and the will, work, fatigue, the interrelation of mental functions, the types of mind, the nature of self, are carefully studied. At the close of each chapter are questions, exercises and references. A complet index makes it easy to turn to any particular discussion for review and further thought and study. The publishers have done their part in making a compact book in a neat and durabe binding, with pages that do not fatigue the eye.

THE VOYAGE OF A VICE-CHANCELLOR, with a Chapter on University Education in the United States. By Arthur Everett Shipley, Master of Christ's College, Cambridge. G. P. Putnam's Sons.

The author of this volume made an extensive tour of our country in 1918 as a member of the British University Mission sent to observe and study our educational institutions and methods. It is well to glimpse a big enterprise like education through the eyes of others, especially when those others are trained and competent observers. We unhesitatingly declare that any reader of EDUCATION who is engaged in ad-

ministrative or instructional work in any school or college, will read this book through if he reads the first few pages. The reviewer read it *almost* through,—a very unusual circumstance! The bigness of the United States, the multitude and variety of its educational activities and the omnipresence of professors and teachers, impressed the author. His chapters are racy and entertaining. His description of the way we celebrated "Armistice Day" is keenly humorous. In fact, every page of this little volume is brightened by flashes of humor. The last chapter is upon the topic, "University Education in the United States." "American universities," he says, "are not hampered by tradition. They are willing to try new things. . . . For instance, Columbia University is so attracted by the success of the psychological tests used for entry into the American Air Force, that it is proposing to give up its entrance examination, and to replace it by mechanical tests, which it claims will be able to show whether a boy is capable of profiting by a University education." A book that gives us the gift of seeing ourselves as others see us!

ORGANIZATION OF HEALTH NURSING. By Annie M. Brainard. The Macmillan Company.

This is a timely volume on a most important matter. Nursing is a profession and as such is in a process of accelerated evolution. The World War and its incidental evils, such as the "influenza" and maladies caused by gassing, exposure, etc., created a demand throughout the world for competent nurses and revealed a shortage that had to be met as best it could be. *The volunteer nurses* distinguished themselves everywhere and gave the profession a new place in the public estimation. A book like this one will meet the demand for a manual of instruction in the fundamental principles of this splendid profession. It emphasizes the necessity of organizing public health nursing in every community, shows what can be accomplished and how to go about it. It is a book which we especially commend to the attention of school superintendents.

ELEMENTARY ECONOMICS. An Introduction to the Study of Economics and Sociology. By Frank Tracy Carlton, Ph. D., Professor of Economics in De Pauw University. The Macmillan Company.

A compact little manual, presenting the subject of economics so clearly as to at once engage the attention and interest of the student. "The changing world in which we live," "Business activity," "Getting a living under various conditions," "The hunting and fishing stage," "The

pastoral stage," "The agricultural stage," "The small tool age," "The factory era." Are not these titles of topics in just the first chapter alluring? The student of today should "thank his lucky stars" for the modern school book makers and their achievements in clothing the dry bones of every subject with the garments of attractiveness and interest. This book is a fine exposition of the subject, a model text book for the class room and might well find a place upon the desk of every business man's office or sanctum.

BASKET BALL AND INDOOR BASEBALL FOR WOMEN. By Helen Frost and Charles Digby Wardlaw, with an Introduction by Thomas D. Wood, M. D. Charles Scribner's Sons. Price $1.50 net.

A very complete, attractive manual which will be warmly welcomed by the constantly increasing number of girls and women who find pleasure and healthful physical exercise in the indoor games named in the title. Besides the pleasure and health considerations there is a real mental benefit in such games as are here described. They develop a host of faculties and powers, promote alertness, quick and accurate decision, team work, etc. Everything is laid out clearly in this volume, in relation to theory and details of practice in these interesting and virile games for women.

APPLIED ARITHMETIC. The Three Essentials. By N. J. Lenners, B. S., M. S., Ph. D., and Frances Jenkins. Book I. J. B. Lippincott Company.

The first of three books intended to cover the work of the second, third and fourth grades. Simplicity and clearness have been well and fully attained in the subject matter. The facts used "are derived from situations which are within the range of experience of nearly all normal children." The books of this series are attractively illustrated. They will strongly tend to redeem a subject which many, if not most, children find dry and hard, and will make it attractive and interesting.

READINGS IN LITERATURE. Book Two. By Franklin B. Dyer and Mary J. Brady. The Merrill Readers. Eighth Reader. Charles E. Merrill Company.

Intended for and well adapted to the eighth grade of the elementary school or the mid-year of the junior high school. It comprises choice selections of poetry, prose, essays, biography oratory, fiction, drama and Scripture. The book lays the foundation for high school English by acquainting the pupil with actual samples of the work of real authors whose writings have been accepted as standard. It has been brought quite

down to date by the inclusion of some choice productions inspired by the World War. It it attractively bound in a durable binding and handsomely illustrated.

THE PRINCIPLES OF AGRICULTURE FOR HIGH SCHOOLS. By John H. Gehrs, B. S., M. S., Professor of Agriculture, Cape Girardeau State Normal School, Mo. The Macmillan Company. Price $2.25.

The author of this excellent manual has ever before him in making the book, the thought that production has not kept pace with the increase in population, in America. He feels that agriculture can and should be so taught and carried on as to insure a much greater production at a lower cost, thus making a far better showing for the agriculturist and for all the allied industries. These results he would secure by improvement of plants of various kinds, improvement of farm animals, treatment of soils, control of insects, economic marketing, better methods in farm labor, careful and scientific farm bookkeeping, etc. All these fundamental matters are carefully treated in the successive chapters of this admirable text book. There are diagrams, tables, drawings and attractive cuts as needed to enable the eye to follow the mind in the development of the argument. Each chapter closes with a series of questions, problems and references.

THE SECRETS OF ANIMAL LIFE. By J. Arthur Thompson, M. A., LL. D., Regius Professor of Natural History, University of Aberdeen. Henry Holt and Company. Price $2.50.

Human interest in the secrets of nature is as old as the race, and the objective field for its exercise is limitless. Professor Thompson has been a gifted and tireless investigator and specialist. He has also the power of descriptive analysis, and is able to reveal to others what he has seen and the natural conclusions to which the facts seem to lead. Here are a few of his alluring chapter headings: "Homing of Sea Swallows"; "Social Life of Wasps"; "The Educability of Snails"; "The Internal Economy of the Sea"; "The Survival of the Otter"; "The Biology of Twins"; "The Storing Instinct"; "The Roving Instinct." Do not these titles make the reader of this brief review notice want to own and read this fascinating book?

A HISTORY OF MATHEMATICS. By Florian Cajori, Ph. D., Professor of History of Mathematics in the University of California. The Macmillan Company.

This is a second edition of this notable contribution to human knowledge of a science which underlies, more than any other, the whole history of modern progress. Mathematics is the basis of the wonderful

discoveries which have made our world a new world, as different from that of our progenitors as is our dream of heaven from the reality of our material realm. To mathematics we owe the progress which we have made in the mastery of nature's forces which has given us command of the water, the air, and of the electrical currents. Mathematics "won the war," more truly than this can be said of any nation or human sentiment or instrumentality. More than in any other subject, however, the ancient world was interested in and informed about the fundamental principles of mathematics,—or, at least, many of them. The practical deductions and applications have been made more generally in modern times; but away back in Egyptian and Babylonian history we find men thinking deeply and formulating terms and deducing conclusions that were logical and profound. The results of such thinking were utilized, too, by various nations,—the Greeks, the Romans, the Chinese, the Japanese, the Hindus, the Arabs, and the European nations, and all human thought, industry and life was profundly affected thereby. To trace man's discoveries upon the subject and his applications to his conception of things upon, above and under the earth,—to follow his thinking upon the eternal principles upon which the world and all things therein have been founded and made,—this surely is a stupendous task. It has been patiently undertaken by this author, whose work has, of course, a thousand dependencies upon the work of others. But patiently and with profound insight and marvelous erudition he has traced, tabulated, interpreted and set forth in language comprehensible by the student of average capacity, these multitudinous, portentous, and consequential facts and principals. Those students who are to take up advanced studies along scientific lines, all who are to specialize in any of the industries, and all persons who are fond of deep, mathematical reasoning and the results achieved thereby, will find an inexhaustible reservoir of knowledge and information in this volume.

Periodical Notes.

In *The Historical Outlook* for February Edith M. Clark gives an elaborate account of "The History Curriculum Since 1850." The opening article in the *Century Magazine* for February is by Frank B. Elser, whose subject is "General Pershing's Mexican Campaign." Another timely and interesting article in this number is Stacy Aumonier's "London Discovers Uncle Abe." It shows how immortal is the spirit of our beloved Abraham Lincoln. An article in *Good Health* for February, on "Children an International Asset," by Reynold A. Spaeth, Ph. D., of Johns Hopkins University, is of value to parents and teachers. "Shall we Cut Out the Discipline" is the title of an interesting discussion opened in *The Outlook* for February 11. The opening article in the Feb. 7th number of *The Scientific American* answers the question "Why Does Your Clock Keep Time?" *The Journal of the Franklin Institute* for February announces "Brannerite, a new Uranium Mineral." A suggestive article for educators appears in *The Scientific American* for Feb. 21, under the title "The Scientific Reason for Failure." It is written by D. H. Colcord.